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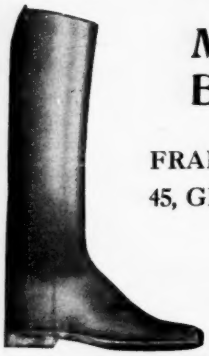

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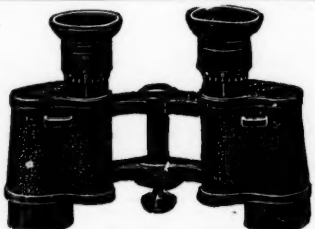

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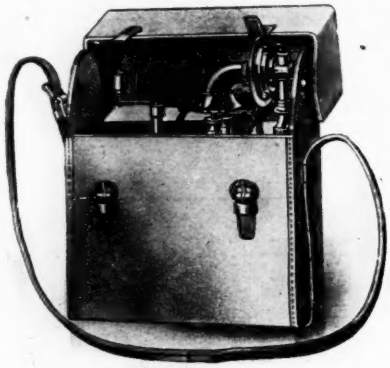

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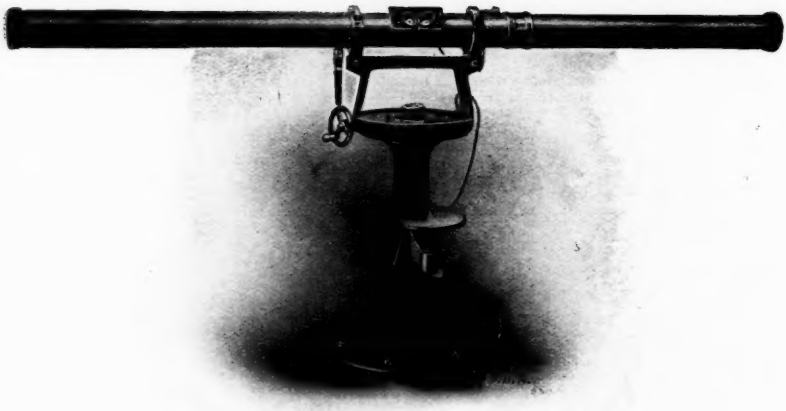

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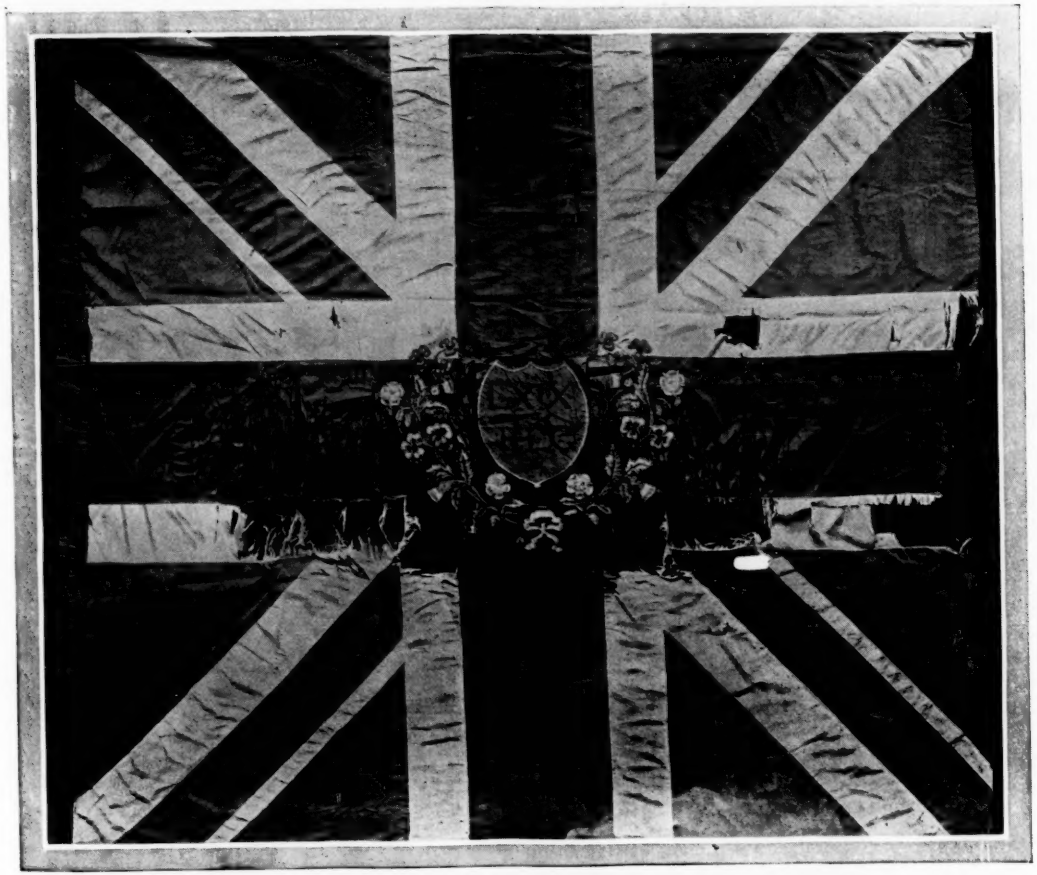

The recovered Colour of the LXIX. Regiment, lost at the Battle of Quatre Bras.
See "A Story of a British Flag," page 1411.

THE JOURNAL

OF THE

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[Authors alone are responsible for the contents of their respective Papers.]

SECRETARY'S NOTES.

I. ROYAL VISIT.

T.R.H. The Crown Prince and Princess of Sweden, and H.R.H. Prince Arthur of Connaught, visited the Museum on Wednesday, 26th October, 1910.

II. NEW MEMBERS.

The following Officers joined the Institution during the month of October:—

Second-Lieutenant R. Evans, H.A.C.
Captain L. W. de V. Sadleir-Jackson, D.S.O., 9th Lancers.
Second-Lieutenant E. W. Sheppard, 10th Bn. Manchester Regiment.
Major W. C. C. Ash, Middlesex Regiment.
Captain J. E. Munby, Yorkshire Light Infantry.
Second-Lieutenant H. J. Walker, 7th Bn. Royal Fusiliers.
Colonel C. Haggard, late Royal Irish Rifles.
Lieutenant S. W. Whately, Royal Munster Fusiliers.
Captain D. D. Gunn, K.O.S.B.
Captain A. G. Macdonald, Royal Berkshire Regiment.
Captain C. D. H. Moore, Royal Warwickshire Regiment.
Rev. Michael Adler, Chaplain (T.F.).
Lieutenant Edward R. B. Kemble, R.N.
Captain H. A. Holdich, 5th Gurkha Rifles, I.A.
Lieutenant E. H. Fawcett, West Riding Regiment.
Captain L. A. E. Price-Davies, V.C., D.S.O., K.R.R.C.
Colonel G. H. H. Couchman, D.S.O., late Somersetshire Light Infantry.
Captain S. F. Muspratt, Indian Army.
Major L. H. Coles, late R.E. (T.F.).
Gentleman-Cadet G. R. Parr, R.M.A., Woolwich.
Captain A. E. McNamara, Queen's Royal West Surrey Regiment.
Deputy-Inspector-General F. J. Lilly, R.N.
Captain Sir M. G. Crofton, Bart., 2nd Life Guards.
Captain Lord R. Wellesley, Grenadier Guards.
Major R. J. P. Anderson, D.S.O., 11th Hussars.
Lieut.-Colonel H. A. R. May, 28th Bn. London Regiment (Artists' Rifles).
Captain B. E. A. Manson, 61st P.W.O. Pioneers, I.A.
Lieut.-Colonel B. Vincent, Inniskilling Dragoons.
Captain John F. E. Green, R.N.
Lieutenant J. B. T. Gough, 1st Bn. Hertfordshire Regiment (T.F.).

Brigadier-General H. J. S. Landon, 3rd Infantry Brigade.
Lieut.-Colonel H. B. Jones, R.E.
Captain A. M. Turner, King's Dragoon Guards.
Captain W. J. N. Cooke-Collis, Royal Irish Rifles.
Lieutenant R. H. Willan, K.R.R.C.
Lieutenant G. E. Cowley, 21st County of London Regiment.
Lieutenant A. F. Brooke, R.H.A.
Lieutenant W. F. Anderson, Royal Fusiliers.
Lieutenant E. G. Sotham, Manchester Regiment.
Brevet-Colonel G. H. Cardew, late A.S.C.

III. INSTITUTION OF NAVAL ARCHITECTS.

The Council of the Institution of Naval Architects will be pleased to consider offers of Papers on subjects relating to Naval Architecture or Marine Engineering. Such offers should, if possible, be sent in by the close of the year.

IV. GOLD MEDAL ESSAY (NAVAL), 1910.

The following additional Essays have been received:—

"Si vis pacem para bellum."

"One and all."

Competitors are reminded that the Essays must be received by the Secretary on or before 30th November.

V. THE EDITORSHIP.

All applications for the post of Editor should be received not later than the first post 1st December, 1910. Such applications should state service, qualifications, age, etc., and enclose copies of testimonials. A competent knowledge of French and German is absolutely essential.

VI. ARMY PROMOTION LECTURES.

A course of eight lectures in Military History on "The Russo-Turkish War, 1877-1878," set for the December Army Promotion Examination, will be given on the following dates, at 4 p.m., the lecturer being Dr. T. Miller-Maguire, Barrister-at-Law:—

Tuesday, 8th November; Friday, 11th November; Tuesday, 15th November; Friday, 18th November; Tuesday, 22nd November; Friday, 25th November; Tuesday, 29th November; and Friday, 2nd December.

The fee for the course of lectures is one guinea for members of the Institution and two guineas for non-members.

Application to attend, enclosing the fee, to be addressed to the Secretary, Royal United Service Institution, Whitehall, S.W.

VII. TEMPORARY MEMBERS.

Officers of the Indian and Colonial Naval and Military Forces temporarily in the United Kingdom, may become Members for a period of six months on payment of 10s. 6d., or one guinea for a period of twelve months; Members of the United Service Institution of India for a period of six months on payment of 5s., or 10s. for twelve months. Such officers may also become Members of the Lending Library for a period of six months on payment of 5s.

VIII. LECTURES.

1. Admiral-of-the-Fleet Sir G. H. U. Noel, K.C.B., K.C.M.G., will preside at the Lecture on Wednesday, 30th November, on "The Matchless Soldier Maid," by the Rev. Bernard Vaughan.

2. Lieut.-General H. D. Hutchinson, C.S.I., will preside at the Lecture on Wednesday, 7th December, on "The American War of Independence, with Special Reference to the Expedition from Canada in 1777," by the Rev. Dr. Belcher.

3. His Grace the Duke of Northumberland, K.G., will preside on Wednesday, 14th December, on "The Strategical Aspects of English Castles," by W. H. St. John Hope, Esq., M.A., F.S.A.

IX. ADDITIONS TO THE MUSEUM.

(3364) Lamp found hanging over the Mahdi's Tomb at Omdurman on 2nd September, 1898.—*Deposited by the Officers of the 21st Lancers.*

(6197) A Pair of Light Infantry Brass Wings, period about 1800, Regiment unknown. They are believed to have been worn both in the Peninsula and Waterloo campaigns.—*Given by Mrs. Belfield.*

(6198) Cannon-Ball and 3 Bullets from the Field of Bussaco, fought 29th September, 1810, by the Duke of Wellington with 25,000 men, to secure his retreat to Torres Vedras. The French, under Masséna, who attacked, numbered 40,000, and were repulsed with a loss of 4,500. The British loss amounted to 1,300 killed and wounded. The Cannon-ball was probably fired by a gun belonging to Crawford's Light Division, and was picked up on the position, by the Village of Sula.—*Given by Raphael Reynolds, Esq., of Lisbon.*

(6199) A British Six-pounder Shot and an early British Shrapnel Shell, unexploded, containing 33 Bullets, from Redinha, which were found in the bed of the river 10 or 12 yards above the Bridge where the greatest fighting took place, and over which the French retreated (12th March, 1811).—*Given by Raphael Reynolds, Esq., of Lisbon.*

(6200) A Musket Ball from the Field of Roliça, fought 17th August, 1808. It was picked up in the Gully, Columbeira, assaulted by the 29th Regiment, and near the spot where Colonel Lake was killed.—*Given by Raphael Reynolds, Esq., of Lisbon.*

(6201) Two Portuguese Silver Coins for 1,000 Reis and 500 Reis, coined 1910, to commemorate the Centenary of the Peninsular War. On the reverse is seen the British Lion guarding the Arms of Portugal.—*Given by Raphael Reynolds, Esq., of Lisbon.*

(These Exhibits were presented through the instrumentality of Professor Oman, of Oxford.)

(6202) Officer's Memorandum Book, compiled by Colonel R. Harrison, C.B., R.E. Captain F. W. Lyons, South Staffordshire Regiment, had this Book in his breast-pocket when attacking the stockade on the Tumbiling River in Penang, in 1904, when it was struck by a bullet with no worse result to Captain Lyons than a severe bruise on the chest.—*Given by General Sir Richard Harrison, G.C.B., C.M.G.*

(6203) A Painting in Water-Colour by J. A. Atkinson, entitled, "The Allied Sovereigns Reviewing the Troops in Hyde Park," period 1814.—*Given by Percy Morris, Esq.*

(6204) A Painting in Water-Colour by J. A. Atkinson, entitled "Defeat of the French Imperial Guard at Waterloo."—*Given by Percy Morris, Esq.*

(Mr. J. A. Atkinson was an artist of considerable merit, who painted military pictures in the early part of the last century.)

(6205) Five Assignats (Paper Money) of the French Republic, dated 1792, for 50, 25, 10, and 5 Livres and 50 Sols.—*Given by Lieut.-Colonel W. H. M. Jackson, late 81st Foot.*

(6246) Autograph Letter of General C. G. Gordon, with Sketch, written to his brother, Sir Henry Gordon, from Sevastopol, during the Crimea, and dated 28th February, 1855.—*Given by Colonel L. A. Gordon, C.B.*

(6247) A Contemporary Bronze Statuette of Marshal Blücher.—*Given by Captain J. F. Lee-Clare.*

(6248) The Maharajpoor Star awarded to Sergeant P. F. Barnes, 40th Regiment.—*Given by Captain J. F. Lee-Clare.*

(6249) A Large Fiji War-Club with knobbed head.—*Given by Lieut.-Colonel W. H. M. Jackson, late 81st Foot.*

(6250) A unique "Broadsheet" or "Poster" announcing the victory of Trafalgar, 21st October, 1805, giving the composition of the Rival Forces, names of ships, commanders, etc., Printed by J. Smeeton, 148, St. Martin's Lane, Charing Cross.—*Given by Messsrs. Crichton Bros., 22, Old Bond Street, W.*

(6251) Silver Pass on the Imperial Military Railway, dated South Africa, 1900, and used during the Boer War.—*Given by Captain E. W. Denniss, R.E. (T.F.).*

(6252) Helmet-Plate of the Jamaica Artillery, and is that of St. Catherine's Corps, which is one of the oldest Colonial Militias.—*Given by Lieutenant E. B. Macpherson, Highland Light Infantry.*

(6253) Pair of Officer's Shoulder Wings of the Light Company, 54th Foot, formerly the property of Lieutenant E. Morris, who retired from the Regiment in 1842, and took Holy Orders.—*Given by Major E. C. Morris, late 2nd Loyal N. Lanc. Regiment.*

(6254) Officer's Belt-Buckle of the 40th Regiment, worn previous to 1881.—*Given by Miss Dickson.*

(6255) An old Spanish Cartridge Belt.—*Given by Lieut.-Colonel W. H. M. Jackson, late 81st Foot.*

(6256) A Sketch of the Battle of the Nile, drawn by Lord Nelson with his left hand. Mr. Alexander Stephens, his Secretary, certifies the authenticity of the Sketch.—*Given by Mrs. Holland.*

(6257) Grape-Shot found in an embankment on the Island of Capri and believed to have been one of those used by the French in the Siege of the Island. Capri was held by the British under Sir Hudson Lowe from 1806 to 1808. In the latter year King Murat of Naples sent a force of French troops, under General Lamarque, to besiege the Island, and took it after 13 days' siege. The loss of the Island was attributed to the absence of naval aid and the misconduct of the Regiment of Malta.—*Given by S. P. Whiteford, Esq.*

A STORY OF A BRITISH FLAG.

AT Azay le Rideau in the Touraine district in France is a very fine *Château* which has been acquired by the French Government and converted into a museum.

Until recently the Curator was M. Louis Xavier de Ricard, son of General de Ricard and great-nephew of General François Xavier Donzelot, who commanded a division in Ney's *Corps d'Armée* in the Waterloo Campaign.

An English officer, Captain J. P. Jeffcock, late Inniskilling Dragoons, visited this *Château* last year and saw in the hall porter's lodge two flags labelled "For Sale." Recognising one of them as a British Colour (the other apparently being Dutch), he inquired their price, and asked to whom they belonged.

It appeared that they had belonged to the Curator of the Museum, the aforementioned Louis Xavier de Ricard, who had given them to the hall porter in liquidation of a debt.

The following extract (translation) from a letter dated 23rd June, 1909, from the hall porter at the *Château* to Captain Jeffcock explains the matter:—

"General Donzelot captured four flags from the English; he gave two of them to the *Musée des Invalides* in Paris . . .

"From General Donzelot the flags passed to his nephew, General de Ricard, and from General de Ricard they passed to his son, Louis Xavier de Ricard, who was keeper of the *Chateau d'Azay le Rideau.*"

The price asked for the two flags was 600 fr. This was at once paid, and thus after a lapse of nearly a hundred years a British King's Colour which had been captured in battle came again into British keeping and has been brought back home.

The flag measures 6 ft. square. Considering its age it is in good state of preservation, as will be seen from the illustration. The silk near the heavy embroidery in the centre is somewhat perished, and the colours of the silk are slightly faded.

The Dutch flag is of no especial interest, nor does it appear, according to inquiries made by the Dutch authorities, to be either a Naval or Military flag; but in any case the present article is not concerned with its history.

The story of the British Colour, however, is of the greatest possible interest, and it is thought that the following evidence will satisfactorily prove that the flag was captured from the 69th Regiment of Foot by the French at the battle of Quatre Bras on 16th June, 1815.

The first intimation of its purchase by Captain Jeffcock appeared in *Le Matin*, published in Paris on 28th June, 1909, in an article headed :—

UN DRAPEAU
conquis par des Français
vient d'être vendu
à un Anglais.

Le beau de l'histoire, c'est
qu'il appartenait à un
conservateur de musée.

Historically the article was full of inaccuracies, but in its two main points it was quite correct, viz., that the flag had belonged to General Donzelot, and that it was a flag of the 69th Regiment.

We, therefore, start with two established facts :—

(1) The flag was once the property of General François Xavier Donzelot, and passed from him into the possession of his great-nephew, Louis Xavier de Ricard.

(2) It is the King's Colour of the British 69th Regiment of Foot.

The 69th Regiment (2nd Battalion) at the battle of Quatre Bras was one of the four regiments which composed the 5th Infantry Brigade (under the command of Major-General Sir Colin Halkett, K.C.B.) of the 3rd Division, the three others being the 30th (2nd battalion), the 33rd, and the 73rd. The 3rd Division formed part of the 1st Corps commanded by H.R.H. the Prince of Orange.

Halkett's brigade was on the left of the allied line, and at Quatre Bras was opposed by Ney's *Corps d'Armée* in which Donzelot commanded a division.

Hence we conclude that the 69th Regiment and Donzelot's division were opposed to, or were at least in the vicinity of each other, and it is not unreasonable to assume that a flag captured in battle *might* find its way into his hands. In any case we know that it *did* come into his possession.

The following evidence establishes the fact that the 69th lost a Colour at Quatre Bras.

In Captain W. Siborne's *History of the War in France and Belgium in* 1815 (third edition, 1848) we read on page 93 that Halkett ordered "the 69th Regiment to prepare forthwith to receive cavalry" :—

"A sudden and heavy cannonade had already opened from the French heights, a sure prelude to the attack which was about to take place, and the 69th Regiment was in the act of forming square when the Prince of Orange rode up to it and asked what it was doing. Colonel Morice explained that he was forming square in pursuance of the instructions he had received, upon which his Royal Highness, remarking that he did

not think there was any chance of the cavalry coming on, ordered him to reform column and to deploy into line. During this last movement a strong body of French cuirassiers, taking advantage of the surrounding high corn and of the circumstance of the regiment lying in a hollow, approached unperceived quite close to the spot, and rushing suddenly and impetuously upon a flank, succeeded in completely rolling up the regiment, riding along and over the unfortunate men, of whom great numbers were cut down, and in the midst of the confusion thus created captured and carried off one of the Colours, in defence of which Major Lindsay, Lieutenant Pigot, and Volunteer Clarke highly distinguished themselves and were desperately wounded."

The extracts from the three letters which here follow are taken from *Waterloo Letters*, edited by Major-General H. T. Siborne, R.E. (Cassell and Co., 1891). They were collected by his father, Captain W. Siborne, and subsequently published and edited by the son, who states in his preface that they "were written with the knowledge that the information contained in them would be conveyed to the public."

I.—Lieut.-General Sir Colin Halkett, K.C.B., G.C.H., 21st March, 1837—page 322 : —

"Unfortunately in the act of forming square *an Officer high in rank* came up to the 69th Regiment and asked what they were about. The reply was the directions they received from me, on which he said there was no chance of the Cavalry appearing, and ordered them to form column and deploy into *line*, which, of course, was complied with, and during this very movement the Cavalry did attack, rode through the 69th Regiment, but situated *as they were* the Enemy suffered a heavy loss. On *our* side the same took place, and, most extraordinary, one of the Colours of the Regiment never appeared after the breaking-up of the 69th Regiment by the charge. I can, I think, say *with truth*, although the Colour was never seen or heard of, that it did *not* fall into the enemy's hands,[1] which of course is satisfactory."

II.—Major S. Rudyard, R.A., 6th May, 1838—page 230. Rudyard was the 2nd Captain of Major W. Lloyd's battery, attached to the 3rd Division Infantry :—

"I was with two guns attached to the 69th, Lieut.-Colonel Morice, and placed myself on their right when I was directed to follow the four other guns of Major Lloyd's battery ordered into action in front of the farm of Quatre Bras, on the Charleroi road, to the support of the Duke of Brunswick. I had hardly quitted the 69th when the Cuirassiers charged from the wood, and before the 69th could get into square they were rode over,

[1] *Note by Siborne.* This is an error. The colour of the 69th was taken by Cuirassier Lami of the 8th Regiment.

broken, and sad havoc made among them, their only Colour being taken, the other being 'in the Hospital of Invalides at Paris, taken at Bergen-op-Zoom.'"

III.—Lieutenant F. H. Pattison, 33rd Regiment. 6th December, 1842—page 334:—

"As we advanced, the leading company of our Regiment reached a prominent part of the field and observed the French Cavalry advancing to the charge. Orders were then given to form square to receive the enemy. The enemy perceiving we were prepared for them, instead of advancing made a movement to the left, broke in upon the open columns of the 69th Regiment, which being on a low part of the field had not observed them. The havoc that then took place was very great, and one of their Colours, I think the Regimental Colour, was carried off in triumph."

Pattison, the writer of this letter, published a book in 1870, printed in Glasgow, for private circulation. It is entitled *Personal Recollections of the Waterloo Campaign in a Series of Letters to his Grandchildren,* by Lieutenant Frederick Hope Pattison, late of the 33rd, the Duke of Wellington's Own, Regiment.

On page 5 the following occurs: "Advancing in open column of companies a voice was heard calling aloud, 'Cavalry, cavalry, form square, form square.' The leading companies of the regiment (33rd) halted immediately, and we soon were in a position to receive them. Having accomplished this important movement, we being then on an elevated part of the field, a large body of French Cuirassiers were seen approaching at great speed. Perceiving, however, that we were ready to receive them, and that the 69th, which was to our left, was still in open column of companies, they brought their left shoulders forward, and passing by us at full gallop, dashed in amongst them, when a terrible sabring ensued. One of the officers (Volunteer Clarke) who carried the regimental Colour, was hacked and cut in a fearful manner. Notwithstanding this he preserved the standard; but the other colour was wrenched from the hands of the officer who bore it and carried off as a trophy of success."

And lastly we find evidence amongst the records in the French Ministry of War. This extract is taken from a report furnished to Marshal Ney by the Comte de Valmy (Kellerman), Commander of the 3rd French Cavalry Corps, and is dated at Frasnes on 16th June, 1815—ten p.m.:—

"J'ai exécuté la charge que vous m'avez ordonnée; j'ai rencontré l'infanterie ennemie placée dans un vallon au dessous de ses pièces. A l'instant, sans laisser aux troupes le temps de réfléchir, je me suis précipité à la tête du 1er escadron du 8e [1]

[1] Cuirassiers.

avec le général Guiton sur l'infanterie Anglo-Hanovrienne; malgré le feu le plus vif de front et de flanc, les deux lignes d'infanterie ont ètè culbutées. Le plus grand desordre était dans la ligne ennemie que nous avons traversée deux à trois fois. . . . Nous avons pris un drapeau du 69e qui a ètè enlevé par les cuirassiers Valgayer et Nourain."

To summarise. The foregoing accounts were written by Officers, all of whom were present at Quatre Bras, some of whom were eye-witnesses of the capture of the flag, and none of whom belonged to the 69th; and they are marked by the invariable sign of good and independent evidence, namely, that while they differ about immaterial details they all agree on the essential points. No one who reads them will doubt for a moment that Captain Jeffcock's flag is the flag lost by the 69th at Quatre Bras.

The loss of a Colour by a regiment has always been most deeply felt, but in this case the loss of its flag reflects neither blame nor dishonour on the regiment. The 69th was placed in an impossible position by the *direct order of a superior Officer*, and this is the end of the whole matter.

While the feeling of all towards the regiment is one of sincere sympathy for the loss of the flag, its recovery is a matter for hearty congratulation. We welcome it back, and we honour a flag which is a memento of one of Wellington's most desperate battles.

NOTE.—The regiment referred to in this article was the 2nd Battalion of the 69th (or the South Lincolnshire) Regiment of Foot. It was raised in 1803 and disbanded in 1816. It had only one battle honour—Waterloo—and this was, *ipso facto*, inherited by the 1st Battalion when the 2nd Battalion was disbanded. In 1881 the 69th Regiment became the 2nd Battalion of the Welsh Regiment.

THE PROPOSED CHANGES IN CAVALRY TACTICS.

By Captain C. W. BATTINE, late 15th Hussars.

On Wednesday, 19th October, 1910.

Major-General E. H. H. ALLENBY, C.B., *p.s.c.*, Inspector of Cavalry, in the Chair.

WHEN I opened my *Cavalry Journal* this morning I was smitten with dismay, because I found that an officer in the 3rd Dragoon Guards, Captain Lascelles, had published an article in it which embodied much of what I was going to fire off at you this afternoon. I was compelled, therefore, to some extent to recast this lecture, so that you might not have the same story over again. But in a way it is very satisfactory to see that we think alike, and that the rising generation of young officers follows the doctrine which is now accepted at headquarters. I think it is a matter of great importance that there should be a doctrine which is accepted in bold outline, which does not at all preclude originality of thought and originality of research. On the contrary, when there is no doctrine, and no discipline of the intelligence, we are apt to run amok, and to get hopelessly lost in a maze of theories which have no very great value. Research in the field of military art depends to a great extent on a sound basis of agreement to start from. It has been said that every Arm of the army, infantry, artillery, and engineers, have progressed and have become more serviceable and more destructive, but the cavalry alone has stood still in recent years. It is said that cavalry are limited by the fact that their practical weapon is the shock, and that the instrument of inflicting it is the horse, whose numbers are diminishing, whose powers are known, and which cannot be further exploited or improved upon. This must be admitted to some extent to be true. There are strict limits to the power of shock, to the power of the horse, and also limits to the number of mounted men you can put in the field; and the number of mounted men that you put into the field with an army has a tendency to diminish in proportion to the other Arms. But I think it cannot be conceded that there is

no room for development of the arm, and no chance of increasing its destructive power. The summer of this year has seen the wide circulation of a book which dealt with the question of cavalry tactics. It was rather remarkable how little knowledge the discussion in question revealed on military subjects. For instance, it struck me that the very word "shock" was employed very much as a right-minded person speaks of the painful surprise which he experiences when he meets a classical statue insufficiently draped! That, of course, is not the meaning which we apply to the word "shock" in battle. Shock tactics in battle is, I think, simply a paraphrase for hand-to-hand fighting, and to assert that hand-to-hand fighting is finished and is incapable of being carried out to good purpose in future wars is to assert that war is cut and dried, that there is no room for the element of surprise and for the element of improvising unforeseen contrivances and devices for attacking the enemy. When it is remembered that war is waged by night as well as by day, in foggy weather as well as in bright weather, in woods, and under circumstances where surprise of every sort is possible, I think it must be admitted that hand-to-hand conflict will frequently find a place in future fighting; and to assert that it is useless for troops to prepare for hand-to-hand fighting seems to be entirely wide of the mark.

With regard to cavalry tactics, in order to be practicable, one tries to imagine the most likely contingency in which our troops will be employed. Of course, our troops are more liable than any other army in the world to be employed in every sort of duty and against every sort of enemy. On the principle that the greater embraces the less, I think we should fix our attention on the most important contingency which is likely to arise, and which the foreign policy of this country in the last five years has rendered more probable than ever, and that is once again our Army is liable to employment in a great European war, in which its appearance may turn the scale as it turned the scale on which the fate of countries depended in the wars of Marlborough and Wellington, and even earlier wars than those. Such a war is perhaps unlikely, and we all hope that it is unlikely, but it would be very foolish and wrong not to take account of it, and I believe by far the most important contingency which our Army has to face is that to which I have referred, and to which our attention should be fixed. Consequently the battle tactics of the great armies of Europe, particularly the work which falls to the masses of cavalry in such contingencies, is the point at which we should aim our training and our thought.

Before you can wage war with cavalry you must have horses for the men to ride. That is so obvious that it might seem to the uninitiated a foolish thing to say, but it really is at the root of the whole question. The war in South Africa saw a great number of regiments and squadrons employed;

and it has been deduced by numerous clever writers that cavalry has lost its power, particularly its power for offence in modern warfare, because it is asserted that they did comparatively so little in South Africa. But these writers have forgotten that that cavalry mostly did not have horses, or, if it had horses, they were in such a condition that they could go only at a slow trot, and therefore their offensive power, their teeth and claws, were to a great extent drawn. As you all know, the force of cavalry maintained in peace in this country is almost ridiculously small compared with the duties likely to be put upon it in case we are called upon to take our place in a European conflict. Not only are all the regiments under-horsed, but in those regiments all the remounts are jammed together with the others; they are frequently put into the ranks for manœuvres. Before a regiment goes to manœuvres it has suffered more casualties than it receives in the first battle of a war, and by the time it comes away from the manœuvres it is diminished to something hardly better than a squadron. Before our cavalry can give a good account of itself, that is a state of things which has to be remedied. In this case the economists in Parliament might find a scope for their energies, because you undoubtedly would save a lot of money by having more horses, and not riding immature horses, which, on the average, are utterly unfit for prolonged and severe work, and by having some sort of reserve. In the first year and the second year it would cost more money to raise the horses, but in the third, fourth, and fifth years you would begin to reap the benefit. Your horses would last longer, and, what is more important still, your cavalry would become a living force and a very strong argument to back up your diplomacy, whereas now every military attaché in this country probably begins his report of our manœuvres by describing the feeble state of the horsing of the British cavalry.

The correspondence of Napoleon teems with anxious enquiries as to the strength of his cavalry regiments in men and horses. The question is as old as war itself. In the wars of the Empire, which never ceased, regiments were marched about from one end of Europe to the other, and the horses were used up without much regard to economy. Nevertheless the Emperor was perpetually demanding the greatest services from the cavalry. The whole of his strategy, with which he conquered Europe, depended on his active and brilliant force of cavalry, and his anxiety about the state of his horses is visible right through his correspondence and right through his despatches. It is amusing and interesting to read how his generals were all in league, and, of course, the colonels of the cavalry regiments also, to hoodwink him in regard to their state. They all took steps to prevent him knowing how many horses were on the sick list, and how many horses were available.

I venture to put forward two suggestions which have for their object the keeping up of the horse supply for the cavalry. One is that, however many men you mount, for however many purposes, you should always have more horses than mounted men. If you take a squadron to manœuvres, and you mean to put 80 men on horseback ready to go out into the field, you should always take at least 90 mature horses for them to ride. An officer in my late regiment wrote to me yesterday, and said that when he was in South Africa he always took care he had ten horses in reserve for each squadron, and he says it made all the difference. Before a horse was cracked up he replaced it with one of those ten horses, and that made all the difference whether the squadron preserved its fighting strength or not. That is one point. The other point is more important still; it is that the strength of the squadron in men and horses depends on the ceaseless vigilance of the squadron commander. The squadron commander in our service is in a different position from the squadron commander in any other. He is not the commanding officer; the colonel of the regiment and not the squadron commander is the commanding officer, though in theory the squadron commander is responsible to his superior, and for this simple reason. The State does not attempt to reward him for his services; on the contrary, it is the squadron commander who rewards the State for being allowed to serve it. Until that state of things is to some extent remedied, until the squadron commander has some direct and strong incentive to exercise the ceaseless vigilance which is necessary, you will only get a proportion of squadron commanders who will take that trouble. As long as human nature is what it is, squadron commanders will not exercise that trouble when they see that it does not pay, or that it does not excite particular remark; and human nature being what it is, the colonel of the regiment will feel that it is upon his shoulders that the responsibility really rests. But the colonel of the regiment has far too much else to attend to, and far too many horses to look after, in order to watch the whole of his regiment; it is therefore perfectly impossible to expect from the care of one man what you might expect from the care of three or four, if they all had the same incentive. I am certain that this is a very important question, both with regard to the horse supply and for many other reasons.

Our men at one time—I do not think it is the case now—were taught that economy was a pitiful thing; they were rather taught to waste their money, to spend it on "swagger," and so forth. The man who had most gold braid on his trousers, and renewed it most often, was said to be "smart." I do not think that is a state of things which prevails now exactly; but I think the tradition remains, and it is an absolute mistake. Economy is a more important virtue in military affairs than in any other; in fact, it is hardly too much to say that the whole

object of military education is to teach a leader when to economise with miserly care the resources entrusted to him in men, horses, ammunition, and leaders, and when to expend them as if their lives meant nothing at all, as if the one occasion had arisen on which everybody had to do or die. The tendency of a bad military education is not to be miserly, to squander, when economy is required, and when the point of the battle occurs which might end the war if everybody went in and risked their lives, to shiver on the brink and do nothing. That has been seen in every army in the world that has been badly trained. Of course, it is the very opposite to what ought to be aimed at. You ought to aim at the most rigid economy as long as economy is possible, and when the moment comes when great results are to be reaped, then throw economy to the winds, attack infantry in line if necessary; do anything and everything to bring about the utter destruction of the enemy's forces in the shortest possible time. Squandering on such an occasion as that sometimes saves not millions, but hundreds of millions.

It has been said that the progress of modern invention has relatively weakened the powers of cavalry. Of course it has in many respects. It is perfectly true that cavalry cannot attack deployed infantry with the great chance of success that used to be possible in the wars of the Empire. It seems to me, after studying a great deal of military history, that it is very hard to strike a sane balance in these matters. For every invention that cuts one way, there is another invention, or another consequence of invention, which cuts the other. Take the present situation on a battlefield, which can be seen by anybody on manœuvres. It is perfectly true that the fire power of a thousand infantry to their front is far, far greater than it was in the days of Waterloo. But then that thousand infantry have to cover a very much bigger front of ground; the bullets they fire, for another thing, will not bring a horse down as a rule unless they hit him in the head; and there are a thousand and one considerations like that. As fast as you get one consideration which tells one way, if you look long enough, you will see another consideration which cuts another way. What is quite new is the intense exhaustion to which troops are exposed, exhaustion which nobody can understand unless they have experienced it. To be fighting for your life for days on insufficient food, with insufficient sleep—which is more important still—lines of infantry stretched out over miles of country, destroys the *moral* and fighting power of troops to such an extent that weapons become altogether a secondary consideration; that is the reason why the reserve of cavalry launched at the critical moment has an opportunity now which perhaps it never had at any previous epoch of war. In all previous wars troops were more or less concentrated on a small space, and it was possible for the resisting side, the defending side, the

side which was suddenly attacked, to bring all its forces to bear in resisting a sudden attack of cavalry, while its men were comparatively fresh, where the ammunition supply was unexhausted, and when, in fact, its fighting power was fully developed. The state of things now is that every time there is a decisive battle fought, a battle on a big scale, there will be large masses of troops found in a state of pulp, utterly worn out, and it will depend on the opposing general if he has any reserves, and if he has the capacity to feel the pulse of his adversary, and to know what is happening on the other side—which is the gift of a great leader—it will be possible for him to make attacks both with cavalry and infantry, but with cavalry especially, because of the rapidity with which it moves, which were never possible before. For that reason alone it appears to me that the tactics of cavalry should be carefully studied to enable them to utilise those opportunities. Opportunities may occur from which you may reap the most enormous results, which may be decisive of a battle, and possibly of a whole war.

It has been asserted, too, by military theorists that in point of fact cavalry cannot exercise destructive power; in other words, they do not kill. They may engender confusion, which may be more or less rapidly remedied, but they do not kill. That also is more or less true, but it is also susceptible of improvement. To begin with, the work of civilisation has been so complete in most of the Western populations of Europe that a soldier taken and trained in the ranks has a curious reluctance to kill, particularly to kill by hand-to-hand fighting, by using a steel weapon. He has to be taught to kill. It has become the duty, and the very essential duty, of the men who train squadrons to train their soldiers, the men who ride in the ranks, that every time the charge sounds, if they are charging an enemy, every man in the ranks ought to account for at least one on the other side, and that he has not done his duty and played the game by his comrades unless he has driven his sword or lance into at least one of the opposing cavaliers. I am certain that is not grounded as it should be in the men in the ranks of the cavalry. The Inspector-General has issued memorandums, and has taken a lot of trouble in regard to this question, and I have not the slightest doubt that in course of time the truth will go home, but it has not gone home yet as it should. It is the duty of the men who train the cavalry to explain that in order to make them the terror they should be, there must be a certain amount of killing. It is true that a battle is won more by the number of men who are frightened than killed; but if you simply flourish swords and lances you do not frighten them, or you do not frighten them enough; whereas if there is a level chance that when the cavalry get in amongst the infantry they stick their lances into quite a large proportion of the infantry, you will find that the modern two-year

conscripts will have the most marked reluctance to remain on the ground when the cavalry charge amongst them. It will have a most salutary effect, and the same effect will be found too in the opposing cavalry. It is said that in the Wars of the Empire a great deal of the reason for the victory of the French cavalry was that they were taught to thrust, though they did not always do it, and if possible to thrust at the vital parts of their opponents. Their opponents were frightened of them; they did not like being thrust in the stomach, and that is what we have to teach our men to do. We must take care that every man thoroughly understands that he has to stick his sword or his lance into the body of his opponent; and when we have taught our men that, our cavalry, small as it is, will be a more terrifying weapon than it is at present. In the charges of the cavalry in South Africa, on the few occasions on which we did get to close quarters with the enemy, it is said that very few of the enemy were killed, in spite of which the cavalry created a considerable moral effect; but you may be quite certain that if instead of sticking a dozen men you stick a couple of hundred that moral effect would be increased enormously. For that to be possible the men must be good riders and must have confidence in their weapons. Our men mostly are good riders; at any rate, they are far better riders than any of the cavalry likely to be opposed to them, and it lies with their instructors to make them confident in their weapons. Personally, I venture to think that the lance is a weapon which should be put in the hands of every regular soldier in our cavalry. It is quite a mistake to suppose that you cannot use the rifle because you have the lance, because you can. It is a little more trouble, but it does not follow that that trouble is not worth taking. It is, in point of fact, a much easier weapon to use with deadly effect than a sword, and there can be no possible controversy about the fact that it is more formidable against infantry. It is not an easy thing to stick a man with a sword as he is lying on the ground, as you gallop over him, whereas it is a comparatively easy thing to do with the lance. I merely throw that forward as a suggestion. The arming of the cavalry with a lance, as has been done in Germany and gradually in France, marks the fact that they are gradually beginning to understand battle tactics in those armies. The rôle of the cavalry on the battlefield is to utterly destroy the enemy's infantry, and the most formidable arm, and the weapon which is most likely to effect that in the case of the cavalry soldier is the lance. In order to get a chance of closing with your adversary your leaders must be men of an altogether superior type. They must be men of serene courage, which is not generally difficult to get, and they must have sufficient love and interest in their profession to have studied it up to a point. I do not think it is at all necessary for every cavalry commander to be a budding Von Moltke, and to be

able to write appreciations and so forth, but he should have sufficient command of language to be able to explain his wishes and his intentions to his men in a manly, simple, and terse manner. It is a mistake to think that all talking is unnecessary. There is, of course, a prejudice against too much eloquence in military circles, and a very understandable prejudice. But all the same, it is an absolutely indispensable machine for teaching, and every man who has to teach his squadron should be able to explain to his men in perfectly simple, plain language what he demands of them; and if he cannot do that the odds are he will not make himself understood. It has the additional advantage of revealing to some extent the character of the leader. When a man makes ever such a short speech to some extent he reveals his character, and on the whole that would be a good thing. It puts the men in communion with their officer, and enables them to realise that he is human, that he takes an interest in them, that he has thought about their profession and the aims they have in common. It is not at all necessary he should be a professional orator for that, but it is necessary that he should understand how to teach sufficiently well to make himself understood. It is also necessary that he should understand the theory of war sufficiently to understand the aims of his superiors, in order that he may back them up. I think every squadron leader ought to be taught to teach up to a point; and when your squadron leaders have reached that point of excellence, that they can teach their squadrons, it will save a tremendous lot of rehearsal of movements and proceedings which are not very clearly understood by the men. A man in the ranks cannot say, "Sir, I do not understand what is wanted;" whereas just a few words of explanation on the part of the leader and a description arouses the interest of the whole lot, and makes the whole task very much easier.

At the same time, the leader should be taught enough of tactics, especially the tactics of the other arms, to make the best use of the ground. That seems very obvious, but generally it is not done. You see the most stupid use of ground made. It is rather exceptional at manœuvres to see the best use of ground made. Troops will needlessly expose themselves to view across ground that hampers their action. Even men who are skilful tacticians will not make the best use of ground unless they have considerable practice at it—unless they can think of a lot of things at the same time and quickly grip in their minds' eye the lie of the ground and the uses it can be put to. All those things count for a tremendous lot in cavalry fighting, in working cavalry against infantry. In most of the battlefields of the present day, which extend over a very wide area, there is a line of approach up to almost every position. You can nearly always work a column, and a great big column, of cavalry quite close up to the enemy's position in

column of troops without being seen, if only you make the best use of the ground. But it is very rarely that it is done, and the reason is that there are very few men who really understand the use of ground, and who have had sufficient practice at it; who have bent their minds enough to the subject, and who have consequently acquired that particular subtlety of intellect which enables them to bring their wits to bear in that particular way. I am certain there is great scope for increasing the offensive powers of cavalry, by teaching the leaders, especially the superior leaders, the commanders of regiments and brigades, to make the very best use of the ground available. It seems a very obvious thing to do, but every manœuvres shows it is not sufficiently understood, and it is worth while, therefore, calling attention to it.

The next important point is the formations in which to approach and attack the enemy. It seems to me that for the cavalry to have a chance nowadays against an enemy armed with quick-firing machine-guns their formations must be such as to admit of very rapid deployment. You can generally only approach on a very narrow front. In France I have seen a division of cavalry approach its enemy in column of fours, which I believe was also done by de Gallifet's division at Sedan. In order to make a charge from a column of fours the leading units must deploy at great speed, must be able to spring into a fighting échelon of some sort, the formation called swarm in Germany. There is no time to form squadrons, then regiments in well-ordered lines. If they break into a trot, then into a gallop, and then from the gallop to a charge, they risk being simply overwhelmed by fire long before they can close with their foe. Whereas cavalry that can charge almost from a column as it goes along, and form some sort of a wedge in échelons of a squadron, or two squadrons at a time, will have many opportunities of attacking that are repeatedly overlooked at manœuvres, and have been overlooked in point of fact in the big battles of recent wars.

Then there is the question of fire power. I think the same line of argument that we have been bringing to bear upon the shock tactics of cavalry apply to fire action. I very much doubt whether any cavalry really economises its power of fire as it should. You must remember its numbers are always relatively very small, and the supply of ammunition is very small. The time that a small number of cavalry can hold up a superior number of riflemen on foot is strictly limited. They must consider all those points and make their dispositions accordingly. They must bring every rifle that they can spare to bear as soon as possible, and the shooting of the men must be much cooler, more under control, and more intelligent than the shooting of the men on foot, or else they will not have a chance in the shooting match. That is perfectly obvious. I have even heard it asserted that the training for fire control

in the cavalry is not so good as it is in the infantry. They will not have the ghost of a chance against a double number of rifles unless their fire is better directed; and in order to oppose dismounted horsemen to infantry riflemen you must have better training, and there is no reason why you should not have better training. To begin with, the horse soldier is longer in the ranks; he is probably more intelligent; he is a better animal physically, and he arrives on the battlefield—which is very important indeed—fresh instead of fatigued by carrying 50 lbs. of kit on his own shoulders during a long march. For all these reasons he should be a very formidable man to fight with whatever weapons you put in his hand. But in order to make that superiority felt he must be better trained, and his fire discipline must be better. Considerable attention should be paid to this. We ought to bring all our wits to bear to make the fire of our men as deadly as possible. I am certain that in foreign cavalries—and I am inclined to think it is so in our own cavalry—there is not enough attention devoted to making intelligent use of fire. Men are taught to fire on the range, and the squadrons mostly shoot as well as the companies on the range, but would they shoot as well on a hillside or rolling plain? I rather doubt it. At all events, they ought to shoot a great deal better.

Finally, there is the question of combining shock with fire tactics. Where you have masses of troops in a battle it would seem very absurd to dismount your cavalry to prolong a line of infantry when there are probably already thousands of infantry standing unemployed waiting to reinforce the infantry line. At foreign manœuvres you do not see the cavalry employed for that purpose, nor is it the least necessary. It would be a mistake to throw your cavalry into a fight on foot, to use them up in that way when there are infantry available for the purpose. But there will be actions undoubtedly when the infantry will not be present to support the cavalry, and in that case the cavalry will have to rely on itself for its own fire power. Then they will have to switch on every machine and every device which they have got in their armoury; they will have to use their horse artillery, their machine guns, and their dismounted men. I think at manœuvres, and even in the training of squadrons and regiments, more pains should be taken to combine the effect of shooting and shock. I think the plan of dismounting alternate units, which does not take long, might be adopted, and that practically no attack should be made, or very rarely made, unless it is prepared to some extent by fire and supported by fire; and after an attack is made, and the cavalry rally, it should be the practice to dismount them and to throw the men in some position where they can defend themselves with their rifles. In a charge on a battlefield it may even be necessary to sacrifice the horses. You charge through the first lines of the enemy's infantry;

then you knock up against the supports in the rear. The men on horseback might be shot to pieces, so that it may be necessary to sacrifice the horses and to throw the men on foot until the succeeding échelons come up to your support and then possibly you may be able to remount. At any rate, there seems to be a great scope for improvement in delivering such attacks, and it is a thing which requires a great deal of practice before it can be done skilfully and with any certainty. The question of one échelon supporting another in time is also very important. The criticism often directed against échelons is that the leading échelons are annihilated before the rear come up to their support. That is one of the questions where a well-trained cavalry can set at defiance an ill-trained cavalry. In well-trained cavalry they will arrive in time; in badly-trained cavalry they will not; at any rate, at the French manœuvres, at which I was present, this year there was a marked tendency to attack in smaller échelons, by one or two squadrons at a time, and particular pains were taken to support the leading lines with the ones following.

I think it is the only safe guide in making plans for the future to go back to the great battles of the past. It is perfectly true that circumstances change, that machinery changes, that weapons change; but it is also true that in the essence of war there is much more that remains constant, that does not change, than can be changed by fresh inventions. To begin with, the spirit of the men, the *moral*, which counts for more than anything else in the battle, is always a constant factor. After the victory of Jena, Murat, the French cavalry leader, swept across Prussia and practically annihilated all that remained of the Prussian army, and he was able to send a despatch to the Emperor: "Sire,—The combat *finishes* for lack of combatants." It cannot be said that the 12,000 men on horseback, armed with the sword and a very slow-shooting carbine, were a match physically for the 150,000 men they dispersed, and for the dozen fortresses they captured. In the same way, I am perfectly certain that nowadays when our Murat takes the field, if he has a strong force of cavalry at his back there will be opportunities for striking blows, perhaps not so deadly and sweeping, because the circumstances of that war were altogether peculiar, and the cavalry pursuit was preceded by a tremendous victory in the field over the one hostile field army, but there will be opportunities for striking blows which will astonish modern Europe. I think we ought always to hold such a possibility before our eyes, and never to forget what has been done in the big battles of the past. We may not be able to do quite such a big thing again, but there may be the opportunity. The last decisive battle our army fought—using the word "decisive" in the sense of a battle that settled the fate of Empires—was the Battle of Waterloo; and I am inclined to think that the charge that finished the Battle of Waterloo, that ruined the French army, that finished twenty years of warfare in twenty minutes,

was delivered under circumstances which may perfectly well occur in any battle of the future. To begin with, it was dark—it was almost dark; the confusion was tremendous, both sides were exhausted. If the battle had then been reduced to a mere infantry combat, it is certain that the French would have retired in considerable confusion off the field, and would have been ready to fight another battle the next day. It was the charge of four or five thousand English light cavalry—you remember the heavy cavalry had already been used up in the fighting in the earlier part of the day—launched at the left wing of the French army, who were too far away from the Prussian attack even to know that it was taking place, let alone to know how it was going—it was that attack which started the panic. The French army then reeled in confusion off the field, and lost their fighting power for a great number of hours. It was that charge which rendered possible the pursuit, and which entirely destroyed it. That performance of our own army is, I think, a tremendous lesson for all time. It has been said that we are only too fond of copying other Powers and learning our military wisdom abroad. There is an example from our own history, the very last decisive battle our army fought in, and it seems to me that nothing has happened since which renders that lesson less weighty and less worthy of being copied if possible. If you study the big battles of the last century, there is not one big battle that did not offer an opportunity for a big cavalry attack. I will not take you right through the military history of the century, but I will invite the young officers who are studying their profession to read those histories with a view to making up their minds whether at Gettysburg, Vionville, Gravelotte, Sedan, Mukden, and on repeated occasions in South Africa, a charge of cavalry, determined to come to hand strokes, would not have produced results of the most far-reaching description.

As I have touched on quite a number of changes that may be produced in future wars by modern machinery and by modern tactics, I think I might conclude by drawing your attention to what never changes, the importance of the determination to win. That never changes, and is infinitely more important than the weapon you use, or even than the tactics you adopt. It is the determination to win, the spirit of the offensive, the feeling of not being satisfied until you have utterly ruined your opponent, that paralyses his will and inspirits your troops. I think it is the possession of a powerful force of cavalry, led by brave and enterprising leaders, that spreads that spirit right through an army; and I think it is the duty of the cavalry of every army, and particularly of ours, to set that example, and never to admit for a minute that our rôle is the defensive rôle, but on the contrary to assert that, whenever we are employed in war, our business is to attack the enemy, to use the cavalry for that purpose, for cavalry is *par excellence*

the weapon of the offensive, and not to be satisfied until the enemy's field forces are absolutely ruined and scattered, as they were at Waterloo.

Lieut.-Colonel W. H. JAMES (late R.E.):—I very much wish that somebody else had opened the discussion on this lecture, but as you have called on me, I shall be pleased to say a few words on certain points that I have noted. I take it that here to-day we have rather to deal with certain suggestions that have been put forward, I will not say for the reform of the Cavalry, but almost for the abolition of the Cavalry in a book which has had rather a wide circulation. The position of *Athanasius contra mundum* is always an interesting one, especially when your Athanasius is extremely cocksure, and that is what we have to deal with in this case. Mr. Erskine Childers has put forward a large amount of what he calls evidence, and as the plaintiff, he is entitled to put forward any evidence he likes. But in dealing with his propositions, we who do not hold the same views as he does are at liberty to produce any evidence we like for the defence. Mr. Erskine Childers has practically limited himself to two wars, the Boer War and the Manchurian War. Speaking as a humble student of military history, I should say he could not have selected two worse examples if he was going to talk to us about Cavalry. Certainly the characteristic of the Boer War was that there were practically no Cavalry actions—I do not say none, but practically none such as are referred to when we read the history of past campaigns, because the Boers possessed no Cavalry. Other reasons have been gone into by the lecturer, and I do not think I need enlarge upon the subject. In the Manchurian campaign there was no Cavalry action. Why? Because the Japanese had hardly any Cavalry and the Russians possessed no Cavalry leaders. If you have no Cavalry and no Cavalry leaders you cannot have Cavalry actions. It takes two to make a fight, and if one does not come forward, the other has not a chance. But let us look, on the other hand, to the opinion of Europe. Does the opinion of Europe support Mr. Erskine Childers? Well, I read a great many journals in which the military opinion of Europe is published, and I have yet failed to discover anybody who supports the views put forward by him. I have read lately a very able series of articles which appeared in the *Militär-Wochenblatt*, which are reviewed in the current number of the *Cavalry Journal*. I recommend those of you who can read German to read those articles in the original, and if not to read the review in the *Cavalry Journal*, because they throw a lot of light on the subject. But apart from European opinion, the weak point of what Mr. Childers has put forward is this: he has absolutely left the *man* out of consideration. A man is only a unit—that I admit—in the organisation of Cavalry, but you have to take his feelings into consideration. In the two wars that Mr. Erskine Childers has selected for his purpose, there were no conflicts between Cavalry. I ask you to consider what happens when there are such conflicts, and in European warfare it is perfectly certain that they will take place. What is the situation of a man whose sole weapon is a rifle, which may not have a cartridge in it at the critical moment, who is opposed by a man armed with a sword or a lance, both of which weapons are always ready for the assault? I think it would be a very uncomfortable one. Fights of that kind must take place between horsemen in those far-out wide-sweeping covering movements which the Cavalries of all European Powers now indulge in. In such cases—I will not say

the hybrid Cavalryman, because Mr. Childers' man has no pretension to be a Cavalryman at all—in such cases this man cannot fight properly on his horse because he has nothing to fight with. He can fight all right on foot, but when it comes to horse fighting he has no means of fighting the man who is opposed to him who is properly armed. Just as we found in the Boer War and in the Manchurian War that the bayonet was a necessity for the Infantryman—in the Boer War it had great moral effect, and in the Manchurian War it was actually used on many occasions—just as the Infantryman soldier wants a point at the end of his rifle for use when he comes to hand-to-hand fighting, so does the Cavalry soldier want something of the same kind. That is totally omitted by critics such as Mr. Childers, who propose to abolish Cavalry as Cavalry, and introduce this mongrel being which they describe as the Cavalryman acting by fire. Again, there is another point to consider. This being, I suppose, in the far-distant future, will fire from horseback. Who is he going to hit? Firing from horseback is not a modern suggestion. If you read old books you will find a great deal about Cavalry skirmishers. The French, for instance, in the wars of 100 years ago, habitually used Cavalry skirmishers with their Infantry skirmishers; we have a good description of a case in "Mercer's Journal of the Waterloo Campaign," where a Frenchman took a pot-shot at him and missed him at a few yards. The same will always be the case when men fire from horseback. Because he has a *rifle* does not make a man aim any truer from horseback. A horse does not keep quiet because a man has a rifle instead of a smooth bore, and the chances of missing are very great. We saw the utility of the revolver, however, in the War of 1861 to 1865 in America, and there is something in the suggestion to employ it. I should say that a Cavalryman armed with one has a distinct advantage. There is another point, namely, what is the very highest organization you can give the Cavalry? I say that is shown by Sheridan. I do not say that his men were all that good European Cavalrymen would be. Sheridan was deficient in subordinate leaders, but he thoroughly knew himself what should be done. What was his habitual plan? Alongside of the dismounted riflemen he habitually used sabre squadrons. You will find that he says so himself, *i.e.*, his men were true Dragoons. As to whether the cold steel weapon is to be a lance or sword, that is a very moot point: one that I think has perhaps not been absolutely settled. There was a great deal of argument about it in Austria, and an article written at the time will be found in our own JOURNAL.[1] The objection to the lance is, that it is said if you stick it in it is difficult to get it out. The Germans have just put a blob at the end of the lance to enable the Cavalrymen to get it out. Some of us have stuck pigs in India, and I think we have been able to get our spears out then. We know that the 10th Hussars, after El Teb, picked up a good many of the lances dropped by the Arabs, because they found them very convenient for sticking the man who was lying flat on his face on the ground, and for that reason no doubt the lance is useful. It is an awkward thing to carry on your horse, and you cannot arm the Cavalryman on the principle of the "white knight," with all sorts of weapons hanging about him. I dare say that the days of Hohenfriedberg are over; we shall never see again results such as were gained by Frederick's Cavalry; but I am perfectly certain there is no evidence to make one believe that

[1] See Vol. XLVII., p. 39.

the days of Cavalry are gone. Opportunities will occur when the *moral* of the enemy has been diminished, which are the very opportunities that the Cavalry soldier has been craving for, and if he takes proper advantage of the arm, the army will still reap as great successes as formerly. It seems to me, therefore, that, looking at the evidence on both sides, we, speaking as members of the military public, as the thinkers who have been asked to consider Mr. Erskine Childers' book, and not put it aside lightly—we who have considered the evidence which has been given on both sides—can unhesitatingly give a verdict for the defendants, a properly armed and trained Cavalry.

Major F. DE B. YOUNG, *p.s.c.* :—The lecturer in the course of his interesting lecture referred to the necessity for the outline of a policy in connection with the training and armament of cavalry; in this we will all undoubtedly most cordially agree, but there is some danger in the adoption of a policy on insufficient or inaccurate data. We have heard something of policies during the last 25 years; when the Mahdi's tomb was blown up with lyddite it was thought that lyddite was going to revolutionise warfare, but in South Africa when these lyddite guns came up, and after firing for some considerable time it was found that the profile or outline of the Boer kopjes was not considerably damaged or altered, the lyddite guns were considered disappointing, and relegated to the ox convoy. Then, again, when we had to approach kopjes through anthills, crawling along the ground was introduced, and in India we received the resultant policy of soldiers wriggling about the ground approaching imaginary kopjes. In the Tirah campaign a certain number of well-organised scouts went out and sniped the sniper; the result was we were told that scouts were all important, and the policy of introducing scouts into the service was worked to death. When the 21st Lancers made their excellent charge at Omdurman it was said that the days of cavalry had revived. In all these cases we had policies of training and armament adopted on insufficient data. The point I want to draw attention to is that, although undoubtedly it is advantageous to have a policy for training and armament, yet it is still more important that we should be sure of the adequacy of the data on which the policy is based. In 1882-3, when I was at Woolwich, one of the questions of the hour of *Military Engineering* was whether a soldier should carry an entrenching tool, or whether that tool should be carried for him, thereby decreasing his load and increasing his power of marching. The question was then said to be under consideration. The other day I turned to a recent issue of *Military Engineering*, and found that the matter was still under consideration. On the question of the *arme blanche* versus the rifle, it seems to me we are asking the cavalry to do too much, to fulfil too many *rôles*. I have the greatest belief in the *arme blanche*; I have the very greatest belief in the rifle, but I think the conditions under which they fulfil their highest purposes are totally different. I think it would be better that not only should they be used on separate occasions, but if possible we should have different men to use them. We used to have the Hussar, the Lancer, the Dragoon, and these all differed in their training and equipment, but the improvement in the modern rifle has levelled them all up. The question now is: Are you going to have a rifleman mounted, or are you going to have a shock tactics cavalry soldier pure and simple? I remember a remark made by Colonel Henderson at the Staff College many years ago, in which he said that

the opinion that he had arrived at was that when a cavalry charge took place on a battlefield all the firing stopped; everybody opened their mouths to stare; but for a cavalry charge to have that effect it must be in sufficiently large numbers. It seems to me, and this I will put forward as a postulate, that the relative importance of the *arme blanche* and the rifle varies directly with the size of the force employed. Take the case of a patrol. That patrol wants information; it does not want to fight, and information that a patrol of a few men can bring in may be of much more importance than the effect of the cavalry action of a whole brigade. I think officers would agree that a patrol seeking information should rather be armed with a rifle than a lance or sabre, and even a contact squadron commander would prefer the rifle to the sword or lance. In smaller parties where the object is to gain information, the retaining power of the rifle makes it of much greater value than the sword or lance. But when you come to large forces of cavalry, the cavalry that have made their name in history, then, where you have divisions of thousands of men, where it is a case of a Marengo or a Sedan, on such occasions every true cavalryman will say: "Chuck the rifle and give me the lance and sabre." Unless we can decide what our cavalry are going to do we cannot say what they ought to be armed with. My own humble idea is that we should have our cavalry for shock tactics and give them the sword and the lance, and not let them have the rifle at all. These should be kept behind until the time arrives for their suitable employment—keep them champing their bits out of range. A suitable quarter of an hour may end the campaign, and when it comes, the cavalry in that quarter of an hour will leave their mark in history. Do not let your cavalry, trained and equipped for shock tactics, be frittered away as scouts used up as a means of gaining information. Let that be done by mounted riflemen. It is just as important for a mounted rifleman to be a good horseman as it is for a shock tactics cavalry soldier. I should be glad, before going back to India, to obtain some expression of opinion as to what the policy is in this country in connection with the arming of the cavalry, whether it is the *arme blanche* or the rifle that is to supervene, and on what accepted data this policy is based.

Colonel F. A. FORTESCUE, late K.R.R.C. :—As an Infantry soldier, I venture to interpose in the discussion for the purpose of making a few remarks from the point of view of that arm of the Service. The question has been asked whether the Cavalry should adopt "shock tactics" or "fire tactics." It is extraordinary to my mind that, as a general rule, those who have been in favour of the abolition of shock tactics have been Cavalry soldiers. I think the reason must be that they have never had the opportunity of being in the Infantry firing line. The lecturer has referred to the great strain that is put upon the Infantry soldier. It is only those who have been in the firing line, and who know, not only the physical strain resulting from fatigue, heat, and want of food, but the nerve strain which is put upon the men, who can realise that there is one point of the Infantry combat when it is literally a toss up of a halfpenny whether the men go forward or backward. If you have a large body of Cavalry in position to intervene at this crucial moment, it is a great thing, because Infantry charged by Cavalry then, and with no cavalry to support it, will be beaten. Cavalry will also have their opportunity against victorious Infantry, for there is a period during which these, too, suffer in *moral*, for even after a successful assault

there is an enormous re-action. An arm like Cavalry, that can dash rapidly forward and make a lightning counter attack, may sweep away Infantry on the very eve of victory. That is why, while anxious to see Cavalry develop their "fire power" to the utmost—for many occasions will arise for its employment—I believe that it would be a cause for extreme regret if anything should be done to deprive Cavalry of their power of employing "shock" tactics.

Colonel the Earl of LONGFORD, K.P., M.V.O. :—I think somebody ought to answer Major Young's suggestion of having Cavalry of two entirely different kinds, a sort of old-fashioned Hussar, to do all the reconnaissance, the screening and that sort of work, and to keep your solemn, stodgy, solid Cavalry for the day of battle and for the one opportunity. It is all very well to write your name on history in a glorious five minutes, but it seems to me that would be a very expensive way of doing it. I remember reading in one of the supplementary despatches of the Duke of Wellington, that he said himself that our Cavalry were so few in numbers that the light and heavy Cavalry had to do the same work. That is what occurred in his time, and it seems to me that is how it works out here. If we had innumerable squadrons, we might keep a large number of Cavalry absolutely behind for use on the field of battle, and have the strategical Cavalry very light, composed practically all of riflemen, putting very little reliance on the sword but on the fire arm for the advanced work. Even there I do not believe they would do the work so well if they came up against Cavalry on the other side, which was prepared to charge, because it seems to me that what we call at manœuvres a "bump" between the strategical Cavalry on both sides (the light Cavalry), would inevitably take place, and then you would be very glad to have your solid formed squadrons, which would be useful for the shock, which ought to go forward, but which, under Major Young's arrangement, would be miles behind with the ox convoy. It does not seem to me that that would be right. It seems to me you would want all your Cavalry, except the divisional Cavalry and probably the protective Cavalry, all the Cavalry that you possibly can have, in the front. That is the only place for them from anything I have ever read. I believe that it is a gross heresy to keep a lot of Cavalry behind simply for the day of battle, in which they might not possibly get an opportunity. I think the French did something like that in 1870. They kept a lot of their Cavalry behind, and some of it covered itself with glory afterwards; but they would have been of very much more use if they had taken on the German strategical Cavalry in the earlier days of the war. I think that has always been considered to be the case, and I believe it is the fact that a great many French Cavalry regiments were taken intact at Sedan without having ever charged at all. I am not sure, but I believe that is so. Certainly a German officer once told me that he was wounded at Mars la Tour and sent back, and while he was convalescing he had charge of a great many captured French Cavalry officers from Sedan; that he had to look after the entire corps of officers of six Cavalry regiments. That looks very much as though those regiments never had a chance of charging at all, so that Major Young's principle does not seem to have worked out well on that occasion. I suppose one is hardly in order if one does not make some allusion to Mr. Erskine Childers. I think his theory has been pretty well answered, more especially by Colonel Fortescue. What Colonel Fortescue said impressed me more

than anything that has been said on the subject, and I think it must have impressed everybody else as well. There can be no doubt of the real effect of Cavalry prepared to charge home and use their weapons on the field. The lecturer has referred to a number of minor points which one might dwell on. I am not at all sure myself whether the lance is so effective as some people claim. I know myself that the moral effect is certainly very great. Even at manœuvres, if you happen to bump up against lances, the lances do frighten one a bit, especially if the lancers show a little symptom of coming down to the "engage." A squadron of lancers riding boot to boot would undoubtedly frighten them. But there are plenty of instances in history of the lance having been beaten by the sword. I think the day before Waterloo is as good a leading case as you can find, when the First Life Guards fairly beat the French Lancers. The Austrians certainly ought to know something about Cavalry tactics, and I believe they will not touch the lance now. I have heard it said that they found that their lancers would not keep the lances down at the moment of the charge; they funked the shock, and up went the lances just before the charge. I do not know whether that is true, but that has been told me by a man in a responsible position, and I believe they gave up the lance after that. This is a subject that might be argued about for ever and ever. The circumstances connected with the sword have not changed since Nolan's book on "Cavalry Tactics" was published in 1852, a very interesting book containing a lot of information applicable to this day.

Lieut.-General Sir R. S. S. BADEN-POWELL, K.C.B., K.C.V.O.:—I have very little to add to this discussion, which has been a most interesting one. I think great temerity has been displayed by some of us in attacking a particular writer on the subject. He has been able to sit down quietly and think the subject out, and to write a book in his study on the whole theory of the thing. He certainly ought to know all about it, and it would be rash to argue with him. But still there are little points in his book which indicate that he is not always quite consistent in his argument. He lays down certain ideas in his own mind about what a battle is and what the different arms ought to do in the fight, and he builds up his argument from perhaps rather a cut-and-dried view. The attacking of Cavalry in masses across an open plain against Infantry in good order he puts down as an impossibility; he says the losses would be too great. That is an idea that has occurred to other people before. It may not be that we should all want to do that particular kind of work; but when he says that no man could live through such an attack, he is a little inconsistent, because on the next page he describes how the Infantry come on and have a grand bayonet fight at the end of a long attack, and if the Infantry can get across in time not to be shot, perhaps the Cavalrymen could get through too. But still it is not in the line of the Cavalry to do the kind of work which he presupposes it will do. As Major Young has stated, we want a policy to begin with before we commence our training, and a policy has never been properly laid down for us. Many of us have asked what our policy should be before we started writing any kind of rules or regulations for the training of Cavalry, but they could only be given us on a very wide basis, namely, that we were to be prepared for almost any kind of fighting, whether it was against European Powers or against savages—we might be called upon to do anything. The only thing one can be sure of from that is, that the *arme blanche* or the firing arm, whatever our weapon may be,

has as its main duty that of producing moral effect. The actual arm of the Cavalryman is his horse; there are no two opinions about that. He must have his horse—a good horse in good condition—and the more he is a horseman and horse-master, the more chance he will have of making an effective attack, whether it be against Basutos or Dutchmen, or anybody else. Also he must have a leader. If his officer is not a keen, well-read, experienced horse-master and leader of men, that Cavalry is not going to do any good at all. It merely means the education and training of the officers, with adequate resources, in times of peace, with trained men who are horse-masters and horsemen; it does not matter much, then, what kind of weapon the individual man has in his hand.

Captain A. S. COTTON, R.H.A. :—We have heard a great many remarks this afternoon about Cavalry and shock tactics, and whether they should be armed with the rifle. The Horse Artillery, however, is an integral part of a Cavalry division, and I should like to know what *rôle* they should adopt. When I have been with the Horse Artillery on manœuvres, we have not been allowed to open fire on the masses of the enemy's Cavalry, when, in my humble opinion, I think we should have been allowed to do so, because, if the Horse Artillery do get effective fire to bear on the enemy *en masse*, although the Cavalry fight may not be brought off exactly where the Cavalry commander wishes, a brigade which has been under the fire of a quick-firing gun will have suffered very considerably, and will probably, when our Cavalry come along, be ridden through much easier. The tactics of the Cavalry apparently rather ignore the new weapon with which the Horse Artillery are armed, the quick-firing gun; and I would, therefore, like to ask what, in the lecturer's opinion, the Horse Artillery should do in this problem?

Colonel LONSDALE HALE, late R.E. :—I rise to speak on account of what fell from my friend General Baden-Powell. We have been told about the moral effect of Cavalry. How many of you know, from your own experience, what the moral effect of Cavalry is? How many of you have been charged by Cavalry on the ground? What do people who say that moral effect is nothing at all know about it? I believe I am the one person in this theatre who has been charged by Cavalry. For several years I was a reporter at the Cavalry manœuvres, and it was my duty always to be in the middle of the fray, and on three occasions did I run a nasty risk of losing my life. On one occasion the Cavalry squadron saw me in front and kindly pulled up. The second occasion was at Long Hill, Aldershot. I was watching a Cavalry Brigade, and had quite forgotten the existence of, I believe it was, the 4th Dragoon Guards. I was at the top of the hill, and suddenly I saw coming up from the base (the hill is rather flat at the top) a line of helmets. Fortunately there was a post with "Long Hill" on it, and I and the post and my umbrella—which I always carried with me—were extended enough to enable the Cavalry to see us—me and the post. I owe quite as much to the post as to myself. But I have not forgotten what my feelings would have been if I had been a soldier in action, and suddenly a line of Cavalry burst on the top of me. That was moral effect. The third occasion was at Cavalry manœuvres. There had been some manœuvres round Lambourne in the morning; it was very foggy, and they did not go off very well. General Keith Fraser was in command, and he decided they would have them a second time in the afternoon. I got the scheme, and I found out where the contact was to be. There

was a young gentleman lunching *al fresco* with me, and he said to me: "Colonel Hale, you seem to know where things are going to take place; may I come with you?" He will not do it again. However, I said: "Yes; there is a seat in my donkey cart, as they call it," and we drove away, and went to the scene of action. I said to him: "There is a regiment behind us which will come in close order and go westward, and we can easily get out of their way; but there are some of the enemy coming down towards us from the south in extended order, and if the worst comes to the worst—you see that bush, we will get behind it." The Cavalry were, as I thought, going past us in extended order, when suddenly they changed front and naturally clubbed. I and my umbrella and this friend of mine made for the bush (it was about 4½ feet high and broad), and we extended as broad a front as we could, and it was just as well we did. Six Lancers, who were clubbed, came straight down to that bush—straight at it. I stood upright, so that they saw me and the umbrella and my friend; it was hardly ten yards from us that the first saw us, and they parted just in time to get by me. The abuse that fell upon my head I shall not forget, but with regard to moral effect, I realized then and know what it is. Fortunately I had a full stomach, and that is everything for one's courage; we all know that. If I had had an empty stomach, if I had not smoked my proper number of cigarettes before that happened, and I had been a tired and defeated soldier at the end of the day, there would have been an end of me. I do not believe that tired soldiers attacked under unfavourable conditions at the right time will be anything but absolutely destroyed and dispersed by the appalling effect of what the general said—horses coming galloping right over them.

Captain J. B. JENKINSON, Rifle Brigade:—As an Infantryman I should like to endorse what Colonel Fortescue has said to you with regard to Infantry fighting; a period may certainly come when it is touch and go what the men will do. Again, as an Infantryman I should like to say that the idea of our Cavalry giving up a steel weapon altogether appears out of the question, and I do not think it is worth arguing about. But I should like to ask whether a Cavalryman can be trained to excel in the use of two weapons? When I say to excel in the use of two weapons, I mean to say whether he can be so good as a rifleman that he is morally and physically capable of taking on the best rifleman in any army and so good a swordsman as to charge the best Cavalry and beat them. The lecturer said that he should be better than the best rifleman. Can you teach a man to be better than the best rifleman, and a good enough swordsman, or a man with a lance to take on the Continental Cavalry, who, I am led to believe, are very good at that form of fighting? Can you teach the men to excel to that extent with both those weapons? Mind you, shock action means concentration, and fire action means dispersion. The two things are very different. Though you may train a man to actually use a sword very well and a rifle very well, can you train your leaders tactically to use the right weapon at the right time? That appears to me to be the chief difficulty in this question, to use the right weapon at the right time. If you can do that, then, as an Infantryman, I shall be very pleased indeed. But if you cannot excel in both, and yet must carry both, which are you going to excel in if you have to make a choice? Are you going to excel in the rifle, while being pretty good with the sword, or *vice versâ*? For surely no one would advocate being only fairly good with both? Is it necessary on an occasion, such

as mentioned by Colonel Fortescue, to have tremendous skill and cohesion in the actual charge? I have been told by Cavalry leaders that it is the cohesion which it takes the time to teach the men—the knee to knee business, which is absolutely necessary if you are going to meet Cavalry. Can you dispense with that and thus gain more time to practice fire tactics?

Major E. T. DIXON, Hants R.H.A. (Territorial Force):—I came here as a student rather than as a critic, but I have a sporting objection to hearing an argument go by default, and as nobody has stood up for Mr. Erskine Childers, who is not here himself, there are a few questions I should like to raise on his behalf, in order that, if possible, some of his arguments may receive an adequate answer, which I do not think they have yet done. The first speaker who took part in the discussion criticised Mr. Erskine Childers for having selected only two wars for discussion, namely, the Boer War and the Manchurian War. He also said that in neither of those wars were there any Cavalry conflicts; he went on afterwards to say that he had left the men out of consideration. I wish to say just a few words on those three points. Captain Battine, in the summary of his lecture, makes at the end what I think is an extremely apposite remark, namely: "We must learn what is likely to happen on a battlefield and adapt our methods to the case"—not what we would like to happen on the battlefield, but what is likely to happen. Now it seems to me the reason Mr. Erskine Childers selected those two campaigns for discussion was that they will give us a good chance of realising what is likely to happen in future wars. The reason there were no Cavalry conflicts in those wars, no shock conflicts that is to say, is, if I understand Mr. Erskine Childers' argument rightly, that he believes that the power of the rifle is so great that it will prevent shock tactics ever coming off in the future, except in very exceptional circumstances. If I understand him rightly, so far from having left out of consideration the human factor, the speakers who have spoken to-day have left out one-half of the human factor themselves, namely, they have left out the psychological factors in the case of a Cavalryman himself. Why is it that there were no Cavalry conflicts, no shock conflicts, in those two wars? It was because the Cavalry themselves did not care to charge, except on one or two occasions, for instance at Elandslaagte, and consequently that on the few occasions on which anything like charges took place they were not carried out as shock charges in the old sense—charges, that is to say, with the *arme blanche*; but they were rifle charges, or they might equally well have been considered as rifle charges. For example, at Klip Drift, that was a charge in the sense of Cavalry riding under fire in approaching the enemy; but it was not an *arme blanche* charge, because it did not result in their using the *arme blanche*, but simply in their getting through. They could get through, but it was not an example of an *arme blanche* charge. There is one point I should like to refer to also, quoting as my text the last paragraph of Captain Battine's synopsis. He says: "In most cases an army commander should husband a sufficient force of Cavalry for the purpose." That is the real point: If you want to use Cavalry for shock tactics you must husband a certain number. To husband them means not only keeping them fit so that when the critical moment arrives they will be able to gallop and charge and use their weapons, but it also means keeping them in a sufficiently compact body. I understand Mr. Erskine Childers' argument is that supposing one body adopts these tactics and

the other side uses its Cavalry simply as riflemen, the result would be that the side using the Cavalry purely as riflemen will be able to put into the fighting line a larger number of rifles. They will, therefore, either be able to out-flank the line of the enemy, supposing their numbers originally were equal, or at the critical point they will be able to produce a bigger fire effect. They will, therefore, be able to force back the enemy where they require it, and hold their own against the enemy where they do not wish to force him back. By husbanding the forces of Cavalry for use for shock tactics, you handicap yourself very severely in the preliminary parts of the engagement. The question is: are the opportunities which you are likely to get for using your shock tactics of sufficient number and importance to justify you in so doing? That is the question which has to be answered by opponents of Mr. Erskine Childers' book, and it is a question which none of the arguments which have been brought forward to-day tends to answer in the least degree. I should be very glad, from my own point of view, if the arguments in favour of shock tactics succeeded. I quite agree with everything that has been said in favour of the moral effect of actual hand-to-hand fighting; but even when it comes to hand-to-hand fighting there is a consideration which we ought to remember that was suggested by one of the speakers: whether some other weapon, not the rifle, nor the sword, but, say, the six-shooter, would not be even more efficient when you get to hand-to-hand fighting? There is one argument in favour of this view which I think I have never seen mentioned. The people who were more likely to know what is the best weapon for hand-to-hand fighting than anybody else were, perhaps, Dick Turpin and Claude Duval. They were the people who not only went in for hand-to-hand fighting pure and simple, but they wished, if possible, to do it by exercising moral influence rather than by actual killing. Do you see them using the sword or the lance? No! They used the horse pistol. It may be that the present repeating rifle with smokeless powder is not as handy a weapon to use on horseback as the horse pistol; but if so, perhaps the Browning pistol or some smaller weapon producing fire effect would be more efficient. But it seems to me there is no doubt that, if a horse pistol is better than the sword and the lance, *à fortiori*, so is some more modern fire weapon.

Major E. R. SHEARMAN, 10th Hussars, *p.s.c.*:—An officer has just asked: "Do Cavalry wish to excel with the rifle or with the sword and lance?" Now, to excel is merely a matter of comparison. From the results of statistics it is known that the Cavalryman on the range shoots better than the Infantryman, consequently it might be assumed that a hundred Cavalrymen fighting with the rifle, and not employing the horse as a means of mobility, would defeat a hundred Infantrymen; but I do not think this would be the case. Victory is not gained by a series of individual duels, but is the result of collective effort well directed. There is no greater means of deception than statistical tables. Cavalry should be proficient in the use of both rifle and the *arme blanche*, each has its opportunities—surely to bind it to one is unwise—there is a golden mean in all things. It is not to be supposed that commanders will exonerate Cavalry from the duties of exploration owing to the advent of the aeroplane—similarly the *arme blanche* cannot be abolished owing to improvements in the rifle. Yet it is strange that Mr. Childers, who so strongly advocates the "charge," should paradoxically wish to employ an arm whose chief virtue is to strike from afar. I am willing to

acknowledge, and I do believe, that many more opportunities will arise in war for the employment of the rifle than the sword; yet to be victorious we must get to hand grips with the enemy, and the rifle is but the means to the end. I would, however, particularly draw attention to the deplorable inadequacy of supply of blank ammunition given to the Cavalryman, and the consequent vicious training it entails. Instead of officers, non-commissioned officers and men being wide awake, full of energy and fight, ready to pour in rapid burst and squalls of fire as chance offers, they are the reverse. Indiscriminate snapping occurs, an occasional shot is fired "to mark a position." The control of fire is not maintained. Again, umpires ignore the effect of Cavalry fire, and few favourable decisions are obtained. The fortuitous selection of ground, the surprise burst of fire, are assets which are often not sufficiently taken into account, although the officer or non-commissioned officer in charge has used great intelligence to gain these factors of success. The result is that it tends to create a distrust in and dislike for the rifle. It is all important that this should be recognised. The Cavalry soldier is fully aware of the power and effect of the *arme blanche*; indeed, he has only to look at his regimental records. But as regards the rifle he may be in doubt, and that doubt will not be dispelled until more encouragement is given to him to use his rifle, and greater results are reaped when he does.

Major-General Sir THOMAS FRASER, K.C.B., C.M.G.:—I am not a Cavalry soldier, and as an Infantryman, in the presence of so many distinguished Cavalrymen, I do not presume to express any personal opinion on the subject which has been discussed here to-day. A month ago I had a letter from America, from an old Cavalry soldier, General James Wilson, and I will give you his views founded on experience, as the commander of a corps of three mounted divisions of Cavalry and mounted riflemen. While staying with him in America in 1905, I went into the question from the point of view of the Northerners, and he gave me their conclusions based on the four years' war for union against State rights. He will win the sympathy of the Cavalry officers present when I tell you he wrote that if he were making an army, and had the means of getting the horses and remounts, and the power of supplying and feeding them, he would have two-thirds of the army Cavalry (Cavalry who could shoot). That is rather a tall order, but I believe he is right, subject to his provisos. I simply mention it to you because it will convince you that he is essentially a Cavalryman in spirit. He told me that the North had 82 mounted regiments when he was Cavalry Inspector-General to General Grant, and it was his *rôle* to reorganise them, to set them to work, to train them, to arm them, and to fight them. What did he do? The mounted men were partly mounted riflemen, whom he re-armed with a long Spencer repeating rifle, firing six rounds, and a repeating pistol; and the Cavalry proper were re-armed with a similar Spencer repeating carbine, a repeating pistol, as before, and a sabre on the saddle. You will remember that was two or three years before the Austrians faced the Prussians with breach-loaders, while the former were armed with muzzle-loaders, and will understand that the Northern States had made a very extraordinary advance for the time, which was, however, denied to the South. I spoke to General Wilson and to the Northern and the Southern officers also; as I had, through the kindness of the President and Mr. Taft, the opportunity of meeting a great many of the small band of distinguished soldiers who still survive

that war, and they were good enough to give me their opinions on this subject, particularly General Wilson, who undoubtedly expressed the general view of the officers on both sides, when he said that as far as they were concerned in the future, as in the past, he did not think the occasions for shock tactics would be numerous, and would play a very subordinate part, as they did in their war of the sixties. His opinion, and that of the officers of the Infantry, Cavalry and Artillery on both sides in that war, as far as I was able to obtain it, was that the successes of Sheridan and Sherman were, in the main, due to the fact that, when they had made their great strategical marches in favourable country, and had to face the Infantry of the South, they, with their repeating rifles and carbines, completely mastered the fire of the old and very bad muzzle loaders that were the main armament of their enemy. Many of the American officers evidently thought that it was because Sheridan and Sherman and General J. Wilson himself led Cavalry which trusted almost entirely to fire, they were able to make such extraordinarily wide-reaching movements with success, against worse armed Infantry at the end. General J. E. B. Stuart, who was, perhaps, the finest Cavalry leader since Napoleon's time at all events, said the Northern Cavalry, to which he was opposed—by which he meant the mounted rifles and the Cavalry with repeating carbines—shot better than the less well-armed Infantry of the Northerners. Naturally they did, so did the Germans in 1866. The officers who took part in the discussion have not mentioned an incident that happened in the Manchurian War, which I think is extremely instructive. The Russians, moving from Mukden, west of the Liao-Ho, broke the neutrality of China, which had been agreed upon between the two hostile Powers, and Mistchenko got down to Niu-chwang with a large force of Cavalry and guns,[1] but he failed to overcome the weak Infantry opposition and retired. No doubt, as General Wilson agreed, when both sides have Cavalry, collisions, mostly on a small scale, will occur occasionally; but mounted men must adapt themselves to the extraordinary increase in the power of the rifle, which has become the supreme factor, and be adepts in its use if they are to have a great future. The increased power of Infantry fire was felt by the German Cavalry very distinctly in 1870-71. I talked with many German officers in France, and they were profoundly impressed at that time by the immensely increased power of Infantry fire, which they saw would very much limit their possibilities. I entirely agree with everybody who has spoken in thinking that we ought to do all in our power to convince Cavalry they are invincible. I have always done so myself. I don't trouble to convince the Infantry armed with repeating rifles. They know it.

Colonel H. de B. de Lisle, C.B., D.S.O.:—I wish to reply to the question Captain Jenkinson asked, which is the most important question

[1] He had two divisions and a brigade of Cossacks, and one division of Dragoons, three Cossack batteries, and twelve extra guns, and two Horse batteries with the Dragoons, or the equivalent of about seven batteries. The Japanese got in a battalion to reinforce the station guard just ahead of the attack, which Mistchenko made with 56 squadrons and 22 guns. Karanov's dismounted squadrons advanced to the attack, after the guns had fired 2,000 rounds, and were heavily repulsed. The Russian Cavalry were ill-trained for fire. The Japanese may have had 1,000 Infantrymen for the defence.

raised to-day, as to whether you can make Cavalry excel in fire tactics whilst they also excel in shock tactics. Before I really enter into the argument, I want to refer to the remark made by Sir Robert Baden-Powell, that the real weapon of the Cavalry is the horse. I am sure all Cavalry soldiers must agree with him in that remark, because, unless we have the right stamp of horse, properly trained, Cavalry cannot excel either with the rifle or with the sword. Therefore I think the answer to Captain Jenkinson's question is this: that under present circumstances we cannot make our Cavalry excel in fire tactics as well as shock tactics, because we have not got sufficient time. The question then comes: Is there any means of finding the time? And I say there is. It goes back to the horse. The reason we have not time at present to make our men expert rifle tacticians as well as expert in the use of the sword and the lance is, that we have to give so much time every year to training our horses for close order manœuvre. I challenge any squadron leader to say that he has not got to do that. I have had some experience in India recently, where, under our present system of providing and training remounts, three or four months every year are spent in re-training the horses, which should have been thoroughly broken in before being put into the ranks. I see a number of young faces here, and I have no doubt there are a number of polo players amongst you. What I am going to say will, therefore, appeal to them. Anyone who has experience of polo ponies will know that if you put a young pony into a tournament in its first season, before being thoroughly trained, it will be ruined for life; after being turned out to grass you must rebreak it the next year, and possibly every year afterwards. You also know that if your pony is thoroughly trained—and it takes eighteen months to do it—then it can go out to grass year after year, and when it comes up again you can put it into a match within the first week of it being conditioned, because it never requires to be rebroken. I strongly maintain that we must have a system under which our Cavalry horses are thoroughly broken before they are put into the ranks, and this takes eighteen months. The Germans are thoroughly alive to this, and their system is as follows:—They keep their remounts for two years. These are inspected after the first year by an inspector of remounts, to see that they are being properly trained; they are inspected after the second year as to whether they are fit for the ranks, and, if not, they are sent back for a third year's training. Until we adopt some similar system we shall not have time to teach our men to excel in rifle tactics. It is said that Cavalry shoot as well as the Infantry. That is quite true, but that very remark shows that we have practically lost sight of the fact that a great deal more is necessary before we can call our men expert with the rifle. It takes an Infantry soldier the whole twelve months to become so expert and we have not too much time to train him. We also know that in the Cavalry we have not too much time to make the Cavalry soldier's training efficient. We have not the time under present conditions to combine both, but we shall have as soon as we have a proper system of supply of remounts, which should be in the first week of October, to every unit—a proper system of training the remount, and a proper system under which no remount is put into the ranks until it is a properly trained Cavalry horse.

Colonel P. A. KENNA, V.C., D.S.O., late 21st Lancers:—The last speaker has answered the question which was asked, as to whether we

could train our Cavalrymen to be expert riflemen and expert swordsmen, or to excel as such, compared with the Continental soldier; and I think, speaking as one who has just finished command of a Cavalry regiment, that we can excel as both, compared with the Continental soldier. We have seven years in which to train our men instead of two, and we have a better material to start with. I do not agree, with all deference to the last speaker, as to there being no necessity to rebreak animals that have been thoroughly broken once and then put into rough work. In India, where you play polo the whole year round, ponies never want rebreaking. But my experience has been that when you have put polo ponies out to grass for four or six months, they require "setting up," and I think every Cavalry horse which has been bucketed about at manœuvres also wants rebreaking or "re-setting up." I do not think you will get over that, however thoroughly they are broken in the first instance. I say that with all deference to the last speaker, because I know he is an expert on the question, but that has been my small experience, and I think it would be very unfair to lay down a hard and fast rule that regiments are not to be given a certain definite time at the beginning of the training in which to rebreak or "set up" their horses. The very gallant defender of Mr. Erskine Childers' contentions has asked one or two questions in the nature of counter criticism. He began with Klip Drift. A great many officers here to-day were there on that occasion. The speaker said that it was not an *arme blanche* charge because the *arme blanche* was not used; but I think most of us who were there will maintain that the reason the *arme blanche* was not used was because it *was* there with us, and the enemy ran away before we could use it. The other point he advanced was the weakening of the line of fire by not putting every Cavalry rifle in it. We know that the proportion of Cavalry in all armies is decreasing rapidly in proportion to the main army, and particularly so with us. We are shorter of Cavalry than other armies; proportionately to the increase of Infantry, the Cavalry are diminishing, and their comparatively small number of rifles, if treated as those of Infantry in the original dispositions of a main battle, are hardly likely to affect the issue. Their mobility is their power, and it should be used at the proper time. We would not appreciably increase the fire-power of our main battle line by placing in it the Cavalry as riflemen, apart from the disadvantages of throwing away its mobility and the, to us Cavalrymen, still undoubted moral effect of the *arme blanche*.

Captain BATTINE, in reply, said:—The discussion this afternoon has ranged over so wide a number of subjects that it would take me an unduly long time to reply as I should wish, and as their importance deserves. The tendency of the discussion has been to drift towards a certain book that appeared in the summer. Perhaps that was inevitable, and perhaps I was rather unfortunate in the choice of the title of my lecture. I certainly did not intend to lecture about that book, or about its main proposition, which was that the Cavalry should be disarmed of its principal weapon. I regard that proposal as too utterly absurd for serious consideration, and not only utter nonsense, but pernicious nonsense. People with a slight smattering of military knowledge seem to think it was a wonderfully clever proposition, because it was so original, and it has caught on with quite a number of people whose support we want in spending our money on sound measures. Consequently the book had,

in my opinion, an extremely bad effect. It was not my purpose to discuss it seriously at all, because I think it is too ridiculous for discussion. As regards the complaint that I did not deal with the Horse Artillery, I can assure the Horse Artillery officers present that it was not from want of respect for that most important Arm, but simply for the reason that there was not time to discuss everything. The use of Horse Artillery up-to-date would almost require a lecture to itself. I think I agree with the remarks that Captain Cotton made on the subject. Major Young has already been replied to, but I think this point was missed: that you cannot be certain of having your mounted riflemen where you want the riflemen and your swordsmen where you want the swordsmen. There is a great deal to be said for having two sorts of Cavalry. Napoleon divided his Cavalry in two. He kept a mighty force of Cuirassiers behind, which he made use of to produce what he called "the event," and which decided many a battle; he employed Light Cavalry, which was differently armed, differently mounted, and in many ways differently organised, to do his strategic work. Our Cavalry is now so small in proportion to the rest of the army, and in proportion to the duties that are going to be crammed on to it, that I do not think such a division would be safe. If we had Cavalry enough there would be something to be said for having a force that was only used for battle tactics; in point of fact, the French still maintain a strong force of Cuirassiers, which they probably do not intend to use for fighting on foot, although they are armed with a carbine. Several speakers discussed the question of training with the rifle and the lance, and questioned whether it was possible to achieve excellence with both. A point was missed, namely, that it is not so much the individual skill of the rifleman or the lancer that counts. A battle is not a series of duels between horsemen and foot soldiers. The result of a battle—and the larger the numbers engaged the more this is true—depends upon a struggle between units, and big units. It is a battle between divisions, not between individuals. Although, of course, it is important that men should shoot straight and be good lancers, still the importance of that can be exaggerated. I have heard it said that the worst shooting corps in peace time produces pretty much the same result as the best shooting corps when it comes to fighting. Certainly the all-important question is whether they have discipline, whether they obey their leaders, and whether the leaders understand fire tactics. It is a question of whether you have time to train the officers and whether there exists zeal to be trained rather than marksmanship. Even when you do make marksmen of your troopers, it does not follow that they will be marksmen on a hillside; whereas the fact of their arriving fresh instead of fatigued will undoubtedly make a great deal of difference to their shooting, whether they are good shots or not. A man who is fresh obviously shoots better than a man who is fatigued. The same thing applies to fighting on horseback. It is a mistake to suppose that you want a lot of mounted duels. You want squadrons who will ride together, who will hold the lance or sword in front of them and stick it through their adversaries. Lord Longford queried what I said about the lance, and was inclined to disagree that the lance was equally good as the sword. But my point was not that in a Cavalry fight the lance has any great advantage over the sword; I doubt whether it has; I should say they were about equal; but there is no question whatever that in charging Infantry the lance has a great advantage. It is very difficult to stick an Infantryman with a sword as he lies on the ground;

it is easy to stick him with a lance, and he knows it. The arming of Cavalry with the lance indicates that your battle tactics are aimed at the total ruin of the enemy's army, and his most mischievous Arm of his army, which is the Infantry, by charging with the lance. I am sure that is the reason the German Cavalry has been armed with the lance. Colonel Fortescue put a point, with great eloquence and great force, that I tried to make, and there is really nothing to add to it. I think pretty nearly everybody agreed with what he said respecting the *moral* of Infantry, that a point is reached when it just takes one little push to send thousands of men off the field, as we sent them off at Waterloo. Sir Robert Baden-Powell alluded to many interesting topics. What struck me as the most important of the many that occurred to him was the necessity for studying the character of the battle you are going to fight, and especially to train our intelligence so as to foresee a little bit what the course of events will be. A man who goes to shoot a stag in the Highlands lays himself out to do it quite differently from an individual who goes out to slaughter a sheep; and yet, judging from what one sees at the manœuvres, many officers, superior officers, will lay their plans as if they were trying to kill sheep and not wild animals. It is very important to act in a battle as if you have got a dangerous and artful opponent against you, and you should train your intelligence in order to try and forecast what the battlefield is likely to be, what the method of your adversary is likely to be; in fact, you should know the ways of your quarry. It is asserted in England that the way we train our officers to be sportsmen is an excellent training for war, and undoubtedly it is if they are real sportsmen, but not if they allow all the work to be done for them by their gamekeeper or huntsmen. The intellectual training of sport is to learn to understand the beast that you are hunting, and the same applies to your enemy in war. We should try in times of peace to understand the characteristics and the tactics of the armies that we are likely to fight against, and we should be prepared when war comes to take advantage of their weaknesses—because every army has its weakness—to take advantage of our own strength, to know what our enemies are likely to do, and be able to circumvent them.

The CHAIRMAN (Major-General E. H. H. Allenby, C.B., *p.s.c.*):—The subject has been gone into so thoroughly by the various officers who have spoken to-day that there is very little for me to say; but there are two or three small points I should like to deal with. The first is the question of shock. Shock has been defined in various ways to-day. Shock is not a man himself striking a man, but a man striking with a weapon in his hand, and that weapon will count in the shock. I think we want to remember that the reason a man has a spear or a sword in his hand is to kill with it. One sees very often, as I think Lord Longford said to-day, that the lance is not brought down to the engage in practising attacks. I have seen regiments charge, waving their swords in the air, some of the men holding their helmets or their caps on with their sabre hand. That is an important point, because you must remember that the men will do in war time what they have done in peace, and if we train men to gallop about the field and make charges with their swords in the air, uttering piercing yells, we shall find they will do the same thing in war. We may hit the enemy and disperse them, but we shall not kill them; and we want to kill them. I think we want to teach

that to our men. The horses, too, are the weapons of the Cavalry in war; the horse acts in the same way as the powder to the bullet; it carries the man up to a position where he can hit the enemy. Then I want to say a word about Cavalry ground. We talk about Cavalry country, but Cavalry must be able to use all sorts of ground. It must be able to fight in enclosed as well as in open country. We want to kill. When we are in enclosed country we must use the rifle; if we are in open country we ought to be able to use both the rifle and the sword. We must be able to take advantage of every opportunity that comes to us. The lecturer laid before us very well the question of economy of horse flesh—that without economy we cannot effect anything. In the South African War the shortage of horses in the Cavalry reduced the power for offence of the troops. At one period, for a short time, I had five squadrons, four of my own and one of the New South Wales Lancers, and the average of the squadron was but 25 mounted men. Then they talk of the little that was done by the Cavalry, when five squadrons could only number 125 horses! It was not our fault; the horses were not forthcoming. I do not know that we were worse horsemasters than anybody else, but the supply of horses was not kept up. You cannot blame the Cavalry for failing when they have not got horses to ride on. By economy in horses I mean a supply of mature horses must be kept in peace, as has been pointed out by Colonel de Lisle, and for those mature horses to last in war time they must be thoroughly trained, as he also pointed out. Eighteen months, I believe, is the shortest time in which you can properly train a horse, and unless it is trained properly to be able to carry weight collectedly, it cannot endure in war. With regard to the question of co-operation with the Artillery—the question as to whether the Horse Artillery should open fire when they like, when they see a good target, must depend entirely on the Cavalry commander with whom they co-operate. The loyal manner in which the Artillery co-operate with the Cavalry shows that there is no feeling that one arm is by itself. We feel that we are both units of one whole, and I do not think there will be much fear of the trouble arising that has been pointed out by Captain Cotton, that the Artillery would not be allowed to fire at a suitable target when they get the chance. In connection with the subject of fire there comes the use of machine guns. That question might be studied by the Cavalry nowadays, because I do not think we make sufficient use of them. The weapon is not properly understood, and I think that, whether in fire tactics or in the tactical use of the weapon, we have hardly yet made a beginning. Personally I believe it is going to have an enormous future before it as a Cavalry weapon. With that and the Horse Artillery I believe that the use of the sword and the lance will be enormously extended. In the mounted attack the use of supporting *échelons* has been brought out by the lecturer. That is absolutely essential. If an attack is going to succeed it must be made in a sufficient number of lines. There must be *échelons* of support. The flank units on their own must drop back, and in addition to them there must be the squadrons in second and third line to give blow after blow. That is more a French idea than a German one. The Germans go in more for the enveloping attack. Personally I am entirely in accordance with the lecturer on that point. Another interesting point he brought out was the Light Cavalry charge at Waterloo. Before the lecture began he took me into the Museum, and pointed out to me, on the excellent model of the field of Waterloo there, where the charge took place; to the North of Huguemont

Farm, which is some 2½ miles away from where the Prussians were; and in the condition of the battle at that moment, at half-past seven or eight in the evening, it is impossible that the French left could have known what was going on on the French right, and undoubtedly that Cavalry charge did decide the battle. It started the panic, which swept right away from the left to the right of the French army. The road by which the French retired only runs something like 800 yards to the west of Planchenoit, where the Prussians were at half-past seven in the evening, and if it had been the Prussian attack that caused the defeat of the French army they could have been on that road, and the French army could not have retired by it. That goes still further to prove the truth of the lecturer's statement. The suggestion of Major Young, that two sorts of Cavalry should be again called into being, steel men and riflemen, has, I think, been dealt with already. I am not in agreement with him. With regard to the question of whether the Cavalry can use both weapons, the rifle and the sword; I think they can. The Cavalry leader must be an opportunist. He must be rather a picked man; but we can find such people if we look for them. He must be able to decide quickly the occasion on which to use the sword or the rifle. It has been suggested that one man cannot be properly skilled in the use of both weapons. What we chiefly want to teach the horse soldier who is going to use cold steel is to ride with sword in line. It is not single action that decides battles, but the united effort of 100 or 200 men, or 1,000 or 2,000 men riding knee to knee with the intention to ride over their enemy and kill him. It is not one man going out to meet another man; the result will be gained by men who ride forward together with their points bearing on the enemy. I sat at the feet of Colonel James some years ago, and he impressed upon me then that never in history had opposing Cavalry come on to meet a solid line of steel like that; and if we can have that glittering line of points, that unbroken line of points, and make sure of having it always, we shall be the people who will not retire. Everyone nowadays agrees that the rifle will be the main arm of the Cavalry in war. Opportunities for the use of the sword will not occur every day, but when they do occur, when those moments are seen and taken by the opportunist leader, the value of the rifle will disappear altogether. The effects will be so tremendous that there will be no question as to the value of the steel. Still, I do not think we use the rifle as skilfully as we should; I do not think our fire tactics or fire control or fire discipline are as good as they ought to be. Colonel de Lisle has lately impressed upon me strongly the fact that we use the magazine rifle as a single loader. We ought to use the magazine more than we do. Everybody has applauded the views put forward so eloquently by Colonel Fortescue, and I heartily agree with them. I think they are in accordance with all sound Cavalry teaching, and with the dogma of our training manuals. It is now my pleasing duty to ask you to join with me in according a hearty vote of thanks to the lecturer. He has taught us a great deal to-day. Not only has he brought forward new ideas and revived old ones, but he has given us food for thought, which has resulted in one of the most interesting *séances* I have ever attended.

CHANGES AND TENDENCIES IN THE RUSSIAN ARMY SINCE THE WAR AGAINST JAPAN.[1]

Communicated.

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I.—INTRODUCTION.

NO great and far-reaching reforms have been carried out in the Russian Army since the War in Manchuria. Any ill-success that attended Russian arms in the Far East has been attributed less to defects in the military system than to the half-hearted interest of the nation in the struggle and to the difficulty of the problem of communications. A number of more or less important changes have been, however, carried out, and a scheme of re-organization and re-distribution is in preparation.

The Duma has exhibited the greatest interest in questions of national defence, and while refusing, pending the re-organization of the Ministry of Marine, to vote large sums for naval construction, has granted money lavishly for army reform. The knowledge gained by the members while serving successive years on the Duma Defence Committee has raised the annual debates on the army estimates, so German and French newspapers report, to a level unapproached in the Parliaments of Western Europe. The Third Duma seems to contain no members who place any other interests before those of national efficiency, and the Minister of War is not only met half way in each fresh demand for funds, but is even urged to additional expenditure.

The total military expenditure has increased from 51¼ millions in 1907 to 55 millions in 1908 and 58¼ millions in 1909.

[1] NOTE.—This article was written in May, 1910.

While expenses connected with the Russo-Japanese War have been mostly defrayed, large sums are still required to provide the stores and *matériel* which the experiences of the war proved to be necessary, and the increase of the pay of all ranks has proved an additional drain.

The following chapters contain a brief account of the reforms which are already effected or are in progress regarding the organization, terms of service, personnel, training, armament and equipment and administration services. Though much still remains to be done, it will be evident that in a future war with popular opinion behind it, the Russian Army will be a formidable fighting force.

II.—ORGANIZATION.

Until the year 1903 the War Minister was responsible to the Emperor alone for the condition of the army. He was assisted by a Chief of the Headquarters Staff, who was also Chief of the General Staff, though not so styled. This officer, who was appointed by the War Minister, was so immersed in administrative detail that he found it impossible to give adequate attention to purely General Staff work.

In the year 1905 the Committee of Imperial Defence was created, under the presidency of the Grand Duke Nicolas Nicolaevich, with the object of co-ordinating the work of the Ministries of Marine and War. At the same time an attempt was made, it is believed on the Grand Duke's advice, to form a Great General Staff on German lines. The departments at Army Headquarters were divided between the General Staff, which was organized to deal with intelligence and operations, and the Headquarters Staff, to which were allotted organization, recruiting, equipment, administration and training. Questions of mobilization continued to be dealt with by both staffs. General Palitsin a protégé of the Grand Duke, was appointed Chief of the General Staff, a position to a certain extent independent of the Minister of War.

Since 1905 the Emperor seems to have hesitated as to whether the Chief of the General Staff should be independent of the War Minister as in Germany and Austria-Hungary, or subordinate to him as in France. The party favouring the concentration of supreme power in the hands of the War Minister has now definitely won. In December, 1909, an order was issued to the effect that the Minister of War has the sole right to report to the Emperor on all military matters.

An outspoken attack in the Duma in May, 1908, upon the Grand Dukes in high military employ was followed by the resignation of the Grand Duke Nicolas Nicolaevich from the Committee of Imperial Defence. His position as president was not filled by a new appointment, and the Committee itself was abolished in August, 1909.

In March, 1909, the Mobilization Section and the Mobilization Committee had been transferred from the Headquarter Staff to the General Staff. In December of the same year the Mobilisation Committee and the Fortress Committee were abolished, and a new General Staff Committee was formed "for the consideration of the more important questions connected with the readiness of the Army for war."

The artillery, engineer, and military educational departments were reorganised in 1908, 1909, and February, 1910. Executive duties were placed under the newly-appointed Inspectors-General of Artillery, Engineers, and Military Educational Establishments, and technical and administrative duties under the Directors of the corresponding headquarter departments.

The duty of providing remounts has been withdrawn from the Inspector-General of Cavalry, and a special remount department has been created.

In December, 1909, the office of Inspector-General of Infantry, which had been only a few years in existence, was abolished, and that of Inspector-General of Musketry was created in its place.

In the same month the Military Education Committee, which had been formed in 1906, ceased to exist. In practice its programme, which embraced the assimilation of all the lessons of the war and the issue of new service training manuals, had proved too wide, while its composition, consisting as it did of 40 to 50 officers, did not conduce to rapid and effective work.

The calling out of the reserve in 1904 cannot be considered a test of the Russian mobilisation system. The mobilisation was not general, and little more than one-fifth of the Empire's available forces were concentrated at the front. The governing factor was the capacity of a single line of rail, and the despatch of troops being necessarily slow, the authorities were enabled to allow abundant time. The experience was, however, sufficient to point out shortcomings in the mobilisation machinery, and recent reforms may be regarded as the result.

In the new mobilisation regulations, which were issued in 1908 to replace those of 1892, the system of the registration and calling up of reserves was revised and simplified. It is interesting to note that in future the names of reservists employed in Government arsenals, railways and factories will be borne on a special list in order to avoid the dislocation of Government work which was noticeable even in the partial mobilisation against Japan.

The depôt battalions in 1904 were formed under the regulations of 1885, which proved antiquated and unworkable. A committee appointed in 1906 drew up new rules, and these have been embodied in an Army Order of 1909. In future on mobilisation a depôt battalion will be formed for each regiment at the front. This battalion will consist of not less than four and not more than eight companies 250 strong. It will remain

in close touch with the regiment at the front, making good wastage in war by drafts of a company at a time. The depôt battalions of an army corps will be grouped in a brigade.

A section has been created at Army Head Quarters for the consideration of questions connected with the evacuation of sick and wounded in war. This will develop on mobilisation into an Evacuation Department with executive powers.

In 1909 two reserve infantry brigades, the 65th and 66th, were transformed into infantry divisions of the field army. This step will probably be followed by the conversion of still other reserve brigades—a measure which will, of course, increase the peace establishment, but will at the same time largely augment the number of efficient soldiers on mobilisation.

Such are the few changes in the organisation of the Russian Army since the war. It is rumoured, however, that it is on the threshold of important developments in organisation and distribution. Two shortcomings connected with the Russian Army in Manchuria caused repeated comment from foreign observers—the frequent and arbitrary improvisation of formations and the apparent want of combination between the different arms in the field. Both of these may be considered the direct outcome of the unsystematic and faulty grouping of units in higher formations in peace time. The 31 army corps consist of two, three, or four infantry divisions. Seven army corps are without cavalry, and the strength of that arm in the remainder varies from one regiment to two divisions. The number of guns in an army corps varies from 96 to 156. In time of peace artillery only nominally forms part of the infantry division to which it belongs in war. In practice it is administered entirely by its own officers. Engineer units are not attached to either divisions or corps, but are grouped in battalions and brigades under the commander of the district. Infantry brigades consist of from two to four regiments, and infantry regiments of from two to four battalions.

III.—TERMS OF SERVICE AND STRENGTH.

In 1906 the duration of colour service in the field army was reduced from five years to three years for infantry and field artillery, and to four years for the other arms; and reserve service was fixed at 15 years for the first category, and 13 years for the second.

The reserve was at the same time divided into two bans, the first ban being composed of all reservists during their first seven years in the reserve, and the second ban of men from the commencement of the eighth year of their reserve service. On mobilisation the men of the second ban will be posted preferably to reserve troops and the lines of communication. This measure may be regarded as a direct outcome of the experience of the

late war when the *moral* and training of the older classes of reservists left much to be desired.

The peace establishment of the Russian Army now amounts to over 1,300,000, an increase of nearly 70,000 since 1906, and of 300,000 since 1900.

The war strength is difficult to estimate with approximate accuracy, but authorities agree that it is probably under four millions. Thus, while the peace establishment of Russia amounts to one-fifth more than that of Germany and Austro-Hungary together, her war strength is exceeded by that of Germany alone.

The regulations for recruiting have not been changed since 1874, and are quite out of date; exemptions for family reasons amount to 49 per cent. as compared with 1 per cent. in France and Germany. The war strength comprises only one in nineteen of the male population of the Empire, while that of Germany, exclusive of the partially trained *Landsturm*, represents one in seven. The maintenance in peace of this enormous number of men has been hitherto considered necessary owing to the danger apprehended on widely separated frontiers from enemies with more efficient mobilisation machinery. Russia, unprovided with a proper territorial system for rapid calling out of the reserves and without sufficient railways to effect their concentration at the threatened point, is forced to maintain troops on the frontier at establishments approaching that of war. The annual expenditure required for the housing, clothing, feeding and training of this mass of men leaves insufficient funds for much needed military reform.

IV.—PERSONNEL.

Officers.—The war revealed many shortcomings in the officer corps, both educational and moral, and the task of raising the general level has been rendered doubly difficult since by the increased number of resignations among the better educated of the junior ranks.

These resignations are said to be due to several causes. The public generally had lost sympathy with the army owing to the disasters of the war and the employment of the troops against the popular party in the subsequent civil disturbances. The prospects of the officers' careers were not enticing owing to the scanty pay, unfair promotion rules, and the generally unattractive character of the stations in the Far East, in Central Asia, or on the western frontier.

The shortage of officers increased with alarming rapidity till in 1908 there was a deficiency of 20 per cent. in the Infantry, 17 per cent. in theArtillery, 15 per cent. in the Cossacks, and 13 per cent. in the Engineers. It is satisfactory to record that the deficiency has recently decreased, probably owing to the

reforms already introduced, from a total of 5,123 in January, 1909, to 4,177 in January, 1910.

Of these reforms the new rules as to pay and pension have proved undoubtedly the most efficacious. From January, 1909, the pay of all officers up to and including the rank of lieutenant-colonel was increased by amounts varying from 25 to 35 per cent. The present rate of pay does not differ materially in amount from that of the officers of other continental armies.

Under the old pension rules, which had remained unchanged since 1839, a "half pension" was granted after 25 years' service, and a "full pension" after 35 years, and there were no intermediate rates. Thus inefficient officers had a strong personal object in completing 35 years' service, and were shielded by their superiors and permitted to remain in the service in order to qualify for pension.

Temporary supplementary pensions were granted to all combatant officers in 1907. These will remain in force till the end of 1910, by which time it is hoped that the revised regulations approved by the Military Council in July, 1909, will have been passed by the Duma and the Council of the Empire. Under these regulations all officers will be entitled after 10 years' service to a pension equal to 20 per cent. of their consolidated pay, rising by increments of 2 per cent. after each subsequent year's service to 50 per cent. on the completion of 25 years. After the twenty-fifth year the annual increment increases by 3 per cent. till finally officers with 35 years' service are entitled to retire with a pension amounting to 80 per cent. of their pay. An officer's widow will receive half the pension to which her husband was entitled at the time of his death, and liberal pensions will be provided for children.

In the year 1859 a subscription pension fund was started, under the rules of which officers who subscribe 6 per cent. of their pay receive on retirement a pension equal in amount to the Government pension. This fund has been mismanaged, and is now in financial difficulties. A majority of the subscribers are in favour of the payment of an increased subscription in order to maintain the pension at the present high rate. It is doubtful, however, whether the authorities will sanction any further deduction from the serving officers' pay.

The old system of confidential reports by commanding officers having proved unsatisfactory, a method by which all reports are submitted to committees of officers assembled at district, army corps or divisional headquarters was tentatively introduced in 1907. The consultative element in this new procedure is said in practice to have proved illusory, for few members of the revising committee are possessed of an intimate enough knowledge of an officer's qualification to justify them in challenging the opinion of his commanding officer. The system, however, will remain under trial till the end of 1910.

The slowness and the inequalities of promotion still cause natural discontent It is true that in 1907 the proportion of the regimental commands reserved for the General Staff was reduced, and in 1909 it was decided that in future only 16 to 20 per cent. instead of 50 per cent. of the vacancies in the command of infantry and cavalry brigades will be filled by special selection. Still, as the great majority of the vacancies in the infantry and cavalry of the line are filled by officers of the General Staff, of the Guard Corps, or by those who have been detached on extra regimental duty, more than half the captains in the infantry and a third of those in the cavalry can never hope to reach the rank of lieutenant-colonel.

The position of the captain in the Russian Army is particularly disheartening. After the war there were large numbers of supernumerary field officers to be absorbed. Pressure has been used to procure the retirement of the inefficient. The Selection Board, which was instituted in 1906, retired in a little over a year 341 generals and 400 lieutenant-colonels. In spite of this there are still supernumeraries in the field ranks, and the number of captains annually promoted bears a very small proportion to the whole establishment.

The age limit which had been advanced in 1906 was once more reduced in February, 1908, and has been fixed as follows for compulsory retirement:—Commander of a corps, 67; of an infantry division, 63; of a cavalry division, 61; of an infantry, artillery, cavalry, or engineer brigade, 60; of an infantry regiment, 58; and of a cavalry regiment, 56.[1] No officer will be promoted to fill vacancies in these ranks after he has reached an age in each case three years junior to the above. Battalion commanders will be retired at 58, and regimental officers up to the rank of company commander at 55. No captain (company commander) will be promoted to the rank of lieutenant-colonel (battalion commander) after he has attained the age of 50. These rules have evidently been framed to admit of the possibility of practically all officers earning the higher rate of pension before compulsory retirement.

The marriage of junior officers has been facilitated by an Army Order of April, 1909. In future officers without private means will be permitted to marry provided they are over 23 years of age and have first obtained the permission of the commander of the unit, to whom a committee of officers will report on the social position and respectability of the lady.

A curious regulation introduced in 1909 is evidently designed to encourage regimental *esprit de corps*. The battalion and company commanders of any regiment decide by secret

[1] On the 1st January, 1909, the average age of the commanders of corps was 59, of infantry and cavalry divisions 56, of infantry brigades (exclusive of independent rifle brigades) 53½, of cavalry brigades 53, of infantry and cavalry regiments of the line nearly 50.

ballot whether any officer below field rank who wishes for transfer to the regiment shall be received or not, and their report is submitted to the regimental commander with whom the final decision rests.

In addition to the above measures, most of which have been introduced with a view to increase the comfort and well-being of the general body of officers, direct steps have also been taken to provide the numbers required. A large number of reserve ensigns and men specially promoted during the war have been given commissions. It is proposed to increase the accommodation at the infantry war and yunker schools for a period of seven years from 1911.

The two artillery schools have proved quite unable to supply the artillery with the number of officers annually required, and for many years vacancies have been filled by the granting of commissions to graduates of infantry schools, who are, of course, without technical training. In the fortress artillery, where such training is of most importance, it was found at the end of 1900 that over 50 per cent. of the officers had been trained in infantry schools. A third school for fortress artillery alone is being constructed, and the Duma Defence Committee recommend the erection of a fourth. It is intended to open new war schools at Orla, Tashkent, and Khabarovsk.

A serious attempt has been made to raise the standard of general and professional education. Military schools have hitherto been of two classes—war schools and yunker schools. In the war schools which continue the education of the pupils trained in the cadet corps, the students are of a superior social class. On the other hand, in the yunker schools both the tone and the level of education are lower. The result is that the general body of officers is divided throughout the service into two classes—the one with the superior social stamp of the war school training, and the other rather despised as graduates of the yunker school.

In the last few years the yunker schools at St. Petersburg, Kazan and Tver have been transferred into war schools.

In 1907, as an experiment for two years, the course of instruction in the yunker and war schools was made identical and generally rendered more practical with the object of fitting the student for the duty which awaits him on joining his unit. The course of theoretical teaching was revised, and the study of military geography and hygiene was substituted for that of of chemistry and mechanics. This experiment having proved successful, has been continued till the present year, and will probably only give way to permanent regulations on the same lines.

A higher standard of general education will be in future required from students on entering the yunker schools, and this will make it possible to devote the whole of the three years'

course to military subjects instead of merely the second and third year as was formerly the case.

In future, graduates of the cadet corps, before entering the war schools and of civilian schools before entering the yunker schools, must serve one year with units as probationers.

The want of thoroughness in the previous training of reserve officers was proved by the many shortcomings of those called to the colours in Manchuria. In future, volunteers of the 1st Category will serve one year with the colours and 12 years in the reserve; those of the 2nd Category, with a lower standard of education, will serve two years with the colours and 12 in the reserve. Both categories will live in barracks while with the colours. They will be called out for a period of six weeks training at least twice during their service in the reserve.

Many years must necessarily elapse before these changes can produce any marked effect on the general body of officers. In the meantime officers' education leaves much to be desired. An officer of the Russian General Staff, writing on the subject in 1909, divides the corps of officers into two classes as considered from the educational point of view. In the first and smaller group, consisting of the Guards, Artillery, Engineers, and technical troops, officers of less than the medium standard of education are the exception. In the second group, which comprises the infantry and cavalry of the line, it is exceptional to find officers of that standard, for instance, in the year 1909 the educational level of 65.5 per cent. of the captains of cavalry, and of 76.5 per cent. of the infantry captains, were below the medium standard.

The chief defects in the work of the General Staff in Manchuria are said to have arisen from the fact that its officers were not in touch with the troops. From the system in vogue it was impossible that the majority of them should have been.

The Russian General Staff has hitherto comprised all those who have survived the third year's, or supplementary course at the Nicolas General Staff Academy. Once appointed to the General Staff, an officer's career is made, and while his special privileges as regards promotion make him an object of envy to the regimental officer, no periodical weeding out takes place as an incentive to continued study. He retains his position on the General Staff and his right to wear its uniform while employed in such lucrative civil posts as governor or chief of police, and frequently returns to General Staff work after lengthy absences in such employment.

His obligatory regimental service comprises a nominal two years in command of a company or squadron, six months in command of a battalion, and a certain period of regimental command, which, however, is often dispensed with. His work at the Academy has been theoretical rather than practical, and

subsequent to that his General Staff work proper has been swamped in a mass of administrative detail, while employment on manœuvres is too rare to afford him sufficient practice in the movement of troops in the field.

The Nicolas General Staff Academy has been renamed the Imperial Nicolas Military Academy. It is officially stated that it will be in future a central institution for the dissemination of higher scientific education among the officers of the army at large rather than a school for the special training of the staff. Successful graduates will only be appointed to the General Staff after a temporary return to regimental duty, and their further promotion will depend on the possession of practical qualifications.

Details of the practical application of these principles have not yet been published.

There is an urgent need of some effective central control over the whole body of the General Staff to secure uniformity of system in the training of officers, to select them for appointments, and to supervise their work. At present the General Officers commanding military districts select their staff officers at their discretion. The centralisation of this power in the hands of the Chief Directorate of the General Staff at army headquarters seems a necessary preliminary to any real progress.

Some important steps have been taken to improve the professional knowledge of the regimental officer.

In 1908 a new edition of the "Instructions for the Training of Officers" was issued. This pamphlet indicates the instructional responsibilities of officers of every grade, and points out that the main object should be to train commanders of all ranks to decide quickly and act energetically on their own responsibility. Regulations are given for staff rides and war games and rules are laid down for the participation of the various staffs in the practical and theoretical exercises of regimental officers.

The Gunnery School, which was designed to afford practical instruction in the tactical employment of field artillery, was reorganised in 1907. In 1909 80 officers were instructed (viz., 65 captains and 15 staff captains) as compared with a total of only 35 in 1890.

The experience of the war clearly proved that a number of infantry officers in the Russian army were insufficiently trained for the scientific direction of fire in action, and that the rank and file had suffered from the dearth of trained teachers in peace.

It was recognised to be desirable that no officer should be promoted to the command of a company before undergoing a thorough musketry training. The Officers' School of Musketry at St. Petersburg was devoted to the preparation of company commanders for promotion to the command of battalions and to scientific experiment. In any case it would have been impos-

sible to adopt it for the training of all officers before promotion to company command, even if they could have been concentrated from distant garrisons.

It was decided to organise experimental musketry courses in the military districts. In 1908 two schools were started in the Moscow Military District and three in the Vilna Military District. In 1909 four additional schools were created in the Warsaw Military District and three in the Kiev Military District. In 1910 it is proposed to extend the principle to the military districts of St. Petersburg and the Pri-Amur.

Staff captains before joining the course are examined by the army corps staff to ensure their theoretical knowledge of the subject. The course itself lasts six weeks, and is said to embrace instruction in other branches as well as that of musketry.

For some time fencing and gymnastic classes have existed in St. Petersburg for the local garrison, and there is a military gymnasium at Warsaw for the preparation of instructors. In the autumn of 1909 a central school of fencing and gymnastics was started at St. Petersburg with the object of establishing a fixed system of teaching in these subjects throughout the army and of experimenting in methods of physical training. The course lasts 10 months—from the 1st October till the 31st July—and will be attended annually by 100 officers.

The course of instruction in Oriental languages at the Ministry of Foreign Affairs and at the Oriental Institute at Vladivostok have proved too theoretical for military objects. In future classes of five to seven officers will be formed for preliminary theoretical study at the headquarters of the Pri-Amur, Irkutsk, Turkestan, and Caucasian Military Districts. Graduates of those classes will then be sent abroad to acquire a practical knowledge of the languages in Japan, China, Persia, and Turkey. Those who pass the examination on their return will be styled "Interpreters," and will receive additional pay amounting to £30 per annum.

The Instructional Balloon Park in St. Petersburg is to be enlarged into a school of aeronautics, and in future 30 officers (26 engineers and 4 fortress troops) will be trained annually. The course will last 10 months, viz., from the 14th December till the 14th October.

Non-commissioned Officers.—It has always been difficult in Russia to induce men to re-engage in sufficient numbers to fill the higher non-commissioned ranks. A Russian company of infantry has seven non-commissioned officers, of whom, by regulation, three should be re-engaged men, but this proportion has never been attained, and the deficiency has reached as much as 50 per cent. At the commencement of 1904 only about one-seventh of the non-commissioned officers were re-engaged men and the remainder were serving soldiers.

The reduction of the period of colour service emphasised the necessity of offering some substantial inducement to men to re-engage. With this object, at the close of 1905, new regulations were issued trebling the pay of re-engaged non-commissioned officers. It was laid down that upon the expiration of two years' re-engaged service suitable men should be promoted to the rank of sub-ensign. Upon the completion of 10 years' service sub-ensigns might go to the reserve or national militia with a bounty of £106. Upon the completion of 13 years' re-engaged service all sub-ensigns should be discharged or transferred to the militia with a life pension of £10 a year.

The pension offered was undoubtedly inadequate, and the regulations failed to attract the number of men required. Arrangements were therefore made with other Ministries in 1908 and 1909 for the reservation of Government posts of an average salary of £30 to £40 per annum for all sub-ensigns discharged after 10 to 13 years' extended service. It was further decided that they should be allowed a four months' furlough on full pay in the 1st, 4th, 7th, 10th, and 13th years of their re-engaged service. These new regulations are reported to have produced a remarkable increase in the number of re-engagements in the first months of 1910. It is doubtful, however, whether they can provide more than a partial remedy. The country is at present insufficiently developed to provide occupation of the kind required for the large number of men whom it is desired to induce to re-engage.

Meanwhile the instructional battalion established at Riga in 1887 for the training of non-commissioned officers on the German system was abolished in 1909.

Under a system which has gradually developed, 50 per cent. of the last batch of recruits are specially selected annually and join the regimental instructional detachments on the 1st of March after a few weeks' preliminary recruits' training. They then go through a seven months' course of instruction in religion, reading, writing, arithmetic, drill, map reading, and hygiene. Those who do not make sufficient progress are weeded out after the first four months; the remainder, after attending company training from the 1st October till the 1st December, are appointed non-commissioned officers.

Unfortunately the general average of the non-commissioned officers of the Russian Army is still below the standard of present day requirements, and much work remains to be done before they can be considered satisfactory leaders of men.

Men.—The raw material of the Russian Army still suffers from want of education and of individuality.

It is satisfactory to note that the proportion of literate recruits is gradually rising. Of the 1903 contingent only 39 per cent. could read and write, but in 1906 the percentage had risen

to 44, and in 1908 to 46. The mass of recruits will, however, remain illiterate till the Central Government has found sufficient funds to introduce general primary education.

It is impossible to hope for individuality in recruits, 75 per cent. of whom are drawn from the peasant class. The Tartar domination and serfdom seem to have robbed them of all natural initiative, replacing it by a wonderful power of patient endurance. Much can, however, be done by careful individual training to foster initiative, and more attention is being paid to this subject in Russia. The company officers, however, are handicapped by the large number of official holidays, ceremonial parades and guards, which it has been recently calculated leave only one year out of the three years' infantry colour service for the actual training of the soldier.

It was said in Manchuria that generally only one-third of the rank and file took part in the fighting, the remainder being employed men or absent from the ranks on various non-combatant duties. Two steps have recently been taken with a view to increasing the number of rifles in the firing line in proportion to the establishment. In 1908 it was laid down that no officer should have more than one soldier servant. This step reduced the number of men so employed from 53,000 to 30,000. It was decided in 1909 that the two company drummers should in future carry rifles and serve in the ranks in war time.

In 1908 it was decided to discontinue the issue of *vodka* on holidays to the troops and to prohibit its sale in canteens. It is considered that this measure has come none too soon in view of the startling increase of intemperance noticeable among the recruits.

Upon the Emperor's personal initiative a scheme is being worked out for the preliminary instruction of boys in the village schools in fencing and gymnastics.

In 1905 the soldier's pay and messing allowances were increased from 2.64 farthings to 1¾d. per diem, his food was improved by the increase of the meat ration and the issue of a new tea and sugar ration, and his general comfort by the issue for the first time of pocket handkerchiefs, soap, and bed linen.

V.—TRAINING.

The necessity experienced by both Kuropatkin and Linevich in 1904-05 of issuing lengthy instructions in the field on matters of the most elementary tactical training does not point to any shortcoming in the teaching of the Russian training manuals previous to the war. These manuals were not greatly inferior to those of other Continental Powers, but they had been insufficiently studied and their principles were not carried out with conviction.

The delay, therefore, in the issue of new editions since the war, which has been much criticised in France and Germany, has evoked little comment in Russia itself. It was felt that the causes of the evil lay deeper, and especially in the composition of the officer corps and in the system of administration.

Many of the reforms already introduced for the weeding out of incompetent officers and for raising the general status and educational level of those that remain and for relieving the combatant officer of administrative detail seem framed to effect improvement in the weakest points of the Russian system, and will in time improve the efficiency of training.

It is a matter for regret that, as far as is known, nothing has been done to divide more evenly the duties and responsibilities among the various officers in the chain of command. Certain grades, such as the army corps, brigade and battalion commanders, are underworked; while others, the division, regiment, and company commanders are crushed under their various duties. The training of the troops naturally suffers.

During the past five years the following training manuals have been published:—

Infantry Training, Part I. (1908); Musketry Instructions (1909); Manual of Field Signalling (1908); Engineer Training, Part I. (1909); Instructions for Infantry and for Artillery in Entrenching, Parts I. and II. (1909); Instructions for Infantry in Engineering, Parts I. and II. (1908).

New editions have not yet appeared of the Field Service Regulations (1904), Cavalry Training (1896), and Field Artillery Training (1904), and the tactical parts of the Infantry and Engineer Training Manuals are still awaited.

All the twelve district commanders have issued lengthy memoranda embodying their individual views of the modifications called for in training by the experience of the campaign in Manchuria.

A consideration of such of these memoranda as are obtainable reveals the evil effect of the delay at headquarters in the issue of authoritative manuals, for the instructions naturally exhibit the varying bent of their authors' minds, and there is danger that the training in different districts may not be conducted on identical principles.

It is, however, generally evident that the staffs of the military districts are endeavouring to train their commands on modern lines. It is more difficult to arrive at any exact knowledge of how far the units themselves have profited by the many memoranda issued. Owing to the political unrest which followed the conclusion of the war a large number of the troops were employed on police duties, and manœuvres on a large scale were not held till 1908.

Foreign military observers are only invited to attend the manœuvres in the St. Petersburg Military District. It is, how-

ever, probably safe to infer that the level of training is higher in that district than elsewhere.

General Tactics.—A writer in *Danzer's Armee Zeitung*, in November, 1909, treating of Russia's almost traditional adherence to the passive defensive, compared the Russian Army of to-day to a heavy-weight muscle-bound prize-fighter, who, in spite of his enormous bulk, lacks activity and quickness, and is therefore at the mercy of a lighter but more wiry and intelligent opponent.

The higher commanders are now endeavouring to instil in all ranks the necessity for offensive tactics. All the memoranda agree that the defensive attitude, if adopted, should be only temporary, and should, moreover, be passive. It is laid down that the personal initiative and independence of judgment of all ranks are to be encouraged. Meddling by superior officers is strictly forbidden, and commanders in manœuvres are directed to remain in the positions they would occupy in war.

Troops must practise concealment from view and extension under fire. Communication must be kept up between all parts of a force. Frequent exercise in night operations is recommended.

It was remarked that the state of training on these lines as revealed by the manœuvres in 1908 and 1909 showed remarkable progress. In the manœuvres of 1909, especially the tendency to attack resolutely, was very marked, and—an unusual phenomenon in Russian tactics—outflanking movements were attempted.

On the other hand, in spite of the increased power of modern firearms, the traditional *culte* of the bayonet handed down from Suvorov's time still holds good. It has not yet been recognised that it is only by the attainment of superiority of fire that the advance of attacking infantry to close quarters is rendered possible. Though much attention has been paid to the service of communication, it is as yet inefficient, owing chiefly to the inferior technical training of the personnel.

The combination between the arms has improved, and it was noticed in 1908 that the artillery supported the infantry more closely than formerly; still, no real progress can be hoped for in this respect till units have been more scientifically grouped. Guns will have to support their infantry more closely when they have been permanently placed for tactical training under infantry division commanders. Engineer units will be once more forgotten in bivouac and even in retirement orders, as was the case in Manchuria, if they are not permanently allotted in peace to mixed commands of the other arms instead of being trained in water-tight compartments in homogeneous brigades. The combination of cavalry with the other arms still leaves much to be desired.

Infantry.—Infantry Training, Part I. (individual, squad, company and battalion drill) appeared in April, 1908, but Part II. (The Battle) has not yet been published. The new work enjoins greater care in the training of the individual soldier. Everyone is to be impressed with the necessity of using his common sense at all times and when necessary of taking the initiative.

Formations are divided into three types, namely, close, open, and extended. The Russian company has always been divided into four sections, and each section into four squads. Each squad will be divided in future into permanent groups of four to six men under the senior soldier.

The use of volleys is still retained, and there is much firing by word of command, probably to facilitate economy in ammunition. The final assault will be delivered as a rule from a distance of 50 paces. If troops are launched from a greater distance they will fire while moving in order to keep down the fire of the defence. The signal for the assault will be given by the battalion commander.

New Musketry Regulations were published in March, 1909, replacing those of 1899. The new edition represents a great advance on the old. Greater importance is now attached to individual field firing exercises, and firing at known distances is confined to the preliminary practices. Training will be progressive. The object of the eight preliminary practices is to teach the young soldier to take accurate deliberate aim. The infantryman will go through all 8 practices in his first year, 5 in his second year, and 3 in his third (29 rounds annually). The cavalry soldier will do 6 practices in his first and second year, and 4 in his third and fourth. The preliminary practices are followed by an annual course of individual field practices (infantry 38 rounds) and by collective field practices (infantry 50 rounds), the selection of which is left to the commanding officer. The year's training is concluded by field firing by a company at war strength.

The allowance of ammunition for infantry has been hitherto 120 ball, but the Duma has voted funds for its increase to 170. For cavalry the allowance is 60 ball. Both infantry and cavalry receive in addition 10 rounds blank and 100 rounds miniature per rifle annually.

The semaphore system of signalling has been definitely abandoned in favour of the Morse. The Manual of Field Signalling, published in February, 1908, lays down that all officers, non-commissioned officers, scouts, cavalry pioneers, despatch riders, and 8 men per company, squadron or battery, will learn the alphabetical system, while the abbreviated or code system must be known to all men at the commencement of the camp training season in their second year's service.

During the war the unsound siteing of trenches constructed by infantry alone under their own officers became a positive danger. In 1907 revised regulations for courses of instruction in field fortification were published. In future one officer, 4 re-engaged N.C.O.'s, and 16 men per infantry regiment will be attached annually to a sapper battalion for a course of one month.

Instruction for the Training of Infantry in field trench work, a small manual, divided into two parts, appeared in January, 1909. Part I. contains the simple data which every private and lance-corporal must know. Part II. the additional knowledge required of the N.C.O. Part III., for the use of officers, has not yet appeared. Generally speaking, breastworks have been lowered in profile and trenches and communication trenches have been deepened.

Parts I. and II. of Instructions for Infantry in Engineering, a small handbook arranged on the same lines, appeared in June, 1908. Part III. is still awaited.

In the years immediately following the war there seemed some danger of the importance of its more obvious lessons, such as the value of extended formations and of concealment being unduly exaggerated. Infantry extended to intervals of ten paces, and the progress of attacks was delayed by man to man advances while still at distant rifle range.

In the last two years, however, troops have evidently become accustomed to move in formations admitting of concealment and proper extensions, and advances have been carried out more rapidly without the sacrifices of the necessary precautions.

Pending the issue of the tactical part of the infantry training the following notes may give a general picture of the lines on which the arm is at present being trained.

It is taught that the final disposition for the attack should only be made after a thorough reconnaissance has been carried out by single companies, scouts or officers' patrols. Section and group leaders should be made acquainted with the task of the company. The firing line should be formed at a distance of 2,300 yards from the enemy's position, and volleys will be used till 1,400 yards, when they give place to individual fire.

It is held that firing at long ranges occupies the men's attention, and helps to keep them steady. Troops extend to about 3 paces as soon as they come under fire. Rushes by small units—groups of 4 to 6 men, or even man by man—are favoured.

Sections advancing must be supported by the fire of the remaining sections, and units not sufficiently advanced to take part in the final assault must support it by their fire. Time may be gained by advancing at night to 450 or 300 yards, entrenching and continuing the advance just before daylight.

In the defensive the general reserve is as strong as possible —one-half to one-third of the whole force. Local counter attacks are constantly resorted to. The firing line is held by half companies and sections entrenched; 400 yards in rear the regimental reserve is protected by trenches of higher profile. Machine guns are used in pairs in the firing line to enable additional units to be withdrawn to strengthen the general reserve.

Cavalry.—The Russian cavalry seems to have made less progress than the infantry. Though the memoranda of the commanders of military districts lay stress on the fact that dismounted tactics should only be resorted to when mounted tactics are impossible, the cavalryman still continues to fight constantly on foot. The combination of mobility with fire tactics in order to effect surprise is not yet understood. When shock tactics are resorted to there seems to be no appreciation of the value of manœuvre to draw the hostile cavalry under gun fire, and the charges are made on a narrow front with no attempt at outflanking, in spite of superiority of numbers.

As before, the scouting leaves much to be desired. Distant scouting is neglected, and for the immediate protection of the force patrols of 12 men under an officer are sent out when one or two selected men would suffice.

General Ostrogradski, the Inspector-General of Cavalry, has pointed out the necessity for improvement in musketry training. In his opinion the experience of the Russo-Japanese war proved that the effect of the fire of cavalry at distances over 800 to 1,000 yards was an important factor in modern war. He considers that cavalry would only in exceptional cases employ fire at closer range. He has laid down that the regimental commander must not wantonly interfere with the squadron commander. Inspections should be surprise ones in order to prevent all possibility of "inspection fever." Higher commanders are recommended to attend parades personally instead of worrying subordinates by calling for written reports on the progress of training.

Artillery.—Though armed with a better gun than the Japanese, the Russian artillery was at a disadvantage in the war, as the new training manual was only issued after the commencement of hostilities. The organisation of the field artillery in batteries of 8 guns with 16 ammunition wagons was considered unwieldy by some observers, but has been retained. The practice of keeping large numbers of guns inactive in the reserve when on the defensive is still adhered to, though deprecated by some district commanders.

The tendency in the war was to avoid loss by remaining at distant range. While batteries now support their infantry more closely, there seems as yet no general appreciation of the fact that this must be done at all risks. It is considered that

no battery under effective hostile fire within a distance of 3,500 yards should limber up and move forward, but that closer support shall be afforded the infantry if necessary by the advance of other batteries from farther in rear. One district commander recommends that a proportion of the batteries be specially detailed from the outset for the close support of the final infantry assault.

A marked preference is given to completely concealed positions from which it is claimed to be possible to engage moving targets. It is held that better fire results can be obtained from such positions. Their use had become so much the rule that in 1908 the Commander of the St. Petersburg Military District found it necessary to remind artillery officers that direct fire positions should not always be avoided.

Much importance is attached to communication in order to admit of the concentration of the fire of several batteries on a single target without massing the guns.

All batteries are provided with escorts of a strength of a company in the attack and half a company in the defence.

The horse artillery is used exactly as the field artillery. The guns are placed in position before the cavalry advances and deploys, consequently they are often left in rear, and are not in a position to beat back hostile reinforcements or immediately take up the pursuit.

Engineers.—Engineer Training, Part I. (Technical) appeared in 1909. Its keynote is the necessity for the concealment of works and for ample means of communication within and to the rear. The entrenchment of machine guns and of field artillery is dealt with exhaustively, 65 pages and 50 plates being devoted to artillery alone.

Reserves.—No training of the reserves took place from 1903 to 1908. In 1909 the men who passed to the reserve in 1902 and 1904 were called out in European Russia for 6 weeks' instruction. They were trained in special companies or detachments by officers detailed from the active army. The first week was occupied by preliminary drill, the next three weeks by musketry, and the last two weeks in manœuvres. In future reservists will be called out for similar periods of training not more than twice during their 7 or 8 years' service in the 1st Ban.

VI.—ARMAMENT, EQUIPMENT, AND UNIFORM.

The infantry rifle is considered to have stood the test of the war well, and no change is contemplated pending the introduction of an automatic rifle.

Machine guns were not much in favour with the Russians at the commencement of the campaign in Manchuria, and such guns as existed were utilised in batteries of eight. The war proved the value of the gun and the necessity for its dis-

tribution in sections attached to infantry regiments. A large number of detachments consisting of 4 to 8 guns each have since been formed. About half of these are equipped with wheeled and about half with pack transport.

The cavalry during the war was equipped with the Rexer-Madsen automatic rifle. It was decided in 1908 to discontinue its issue, and in future the Russian cavalry will be provided with Maxims. It has not yet been definitely decided whether these will be organised in companies attached to divisions or distributed in sections to regiments as in the infantry.

The re-armament of the field batteries of the field army with the 1902 model 3 in. Q.F. gun with shield, panorama sight and armoured ammunition wagon is now practically complete, and will be absolutely so by the end of 1910. The Russian field batteries were armed with guns of the 1900 model during the war, but one battery of the 1902 model arrived in Manchuria before the cessation of hostilities. The chief improvements in the 1902 model over that of 1900 lie in the provision of shields and in the elimination of the indiarubber springs as a means of checking recoil. It is recognised, however, that the field artillery, while excellent in quality, is weak in quantity, and it is considered urgently necessary to increase the number of field guns beyond the present ratio of 3½ guns per 1,000 rifles.

A new 4.7 in. Q.F. howitzer, model 1907, was adopted in 1909, and the howitzer batteries are now in process of re-armament. This gun is an improvement on the Krupp 4.7 Q.F. howitzer, four batteries of which arrived in Manchuria in September, 1905.

At the outset of the campaign the Russian Army was unprovided with mountain artillery of modern type. The mountainous character of the theatre of war and the successful use by the Japanese of their mountain gun even against the Russian field gun brought home to the authorities at St. Petersburg the necessity of providing their park batteries with an improved armament. These batteries have since been armed with the 3 in. Q.F. gun, model 1904, which is in turn to be replaced by a Schneider gun to be manufactured in Russia.

The horse artillery gun is considered too heavy, but no change is at present contemplated.

As a result of the experience gained in the war the number of entrenching tools carried by infantry has been increased, and will consist in future of 140 light spades, 30 light axes, and 30 pick-shovel entrenching implements per company as compared with the former equipment of 80 light spades and 20 light axes.

Greatly increased importance is attached to communications in the field, and all regiments are to be equipped with telephones.

Russian uniforms have been much changed since the war. There will be in future a ceremonial and a field service dress. The latter is to be stored till 1913, when supplies of the ordinary dress will be exhausted. It is of a grey-green colour, and will be worn for ordinary parade work as well as on field service.

Though much progress has been made in the provision of *matériel*, and though the actual armament of the field army will be in a highly satisfactory state at the end of 1910, Russia still remains at a disadvantage as compared with more highly-developed countries owing to the backward state of her industries. During the late war a large amount of ammunition was obtained from Austria, and at the present time, in the event of the closing of the western frontier, Russia's internal resources would be insufficient for the provision of the constant supply of *matériel* required. To take an instance, it transpired during a sitting of the Duma that most of the sulphur and saltpetre come from abroad, and it is impossible in peace to keep a sufficient reserve of powder in hand to provide for the possibility of the interruption of foreign supplies in time of war. The situation of most of the gun, cartridge and clothing factories in St. Petersburg and the immediate neighbourhood constitutes an additional disadvantage from the strategic point of view.

Little use was made of balloons in the Russo-Japanese war. The apparatus was clumsy and the personnel inexperienced. Though Russia is still backward in aerial science in comparison with other continental nations, a sustained campaign on the subject in the press has attracted much attention to the matter in the last two years. The Government now possesses 3 dirigibles, while two more are under construction, and 3 have been ordered. Six aeroplanes are ready for use, while 10 more have been ordered for Government and 9 for the Russian Aero Club.

VII.—SUPPLY AND TRANSPORT.

In the campaign of 1904-05, as in all previous wars, the Russian Army was indifferently served by the supply and transport branches. It is to their failure rather than to the want of roads in Manchuria that the dependence of the Russian troops on the railway and their consequent immobility is to be chiefly ascribed.

In the supply department important changes have taken place since the war, and still more are in prospect.

In 1906 a course of instruction for officers in supply duties was instituted. It is open to officers of all arms and to civilian officials of the Intendance. The number of students was increased in 1908 to 125, and in 1909 to 150.

Previous to 1907 Russian units provided their own food and forage, and bought and made up their own clothing, boots,

and necessaries. Such a system was open to manifest drawbacks; the regimental officer was absorbed in administrative detail, and a large proportion of the rank and file was constantly withdrawn from legitimate training. The disadvantages of the system were accentuated by the change in the conditions of service in 1905, when it became evident that the whole permanent staff was necessary to train the contingents adequately in the shortened period of colour service.

Experiments were started in 1907 with the object of gradually relieving units of this unnecessary burden, the idea being that in future the supply corps should issue ready-made clothing, boots, and linen. Besides relieving combatant units of a mass of administrative detail, the new system has the additional advantage of enabling the Intendance to arrange in peace the necessary machinery for the supply of clothing and equipment in war, a duty which it is then bound to take over. The system is still under trial, and final orders will be issued on the subject in 1911.

Further, in 1908 a trial commenced of a new system of interior economy under which officials of the supply corps are appointed to each unit to relieve combatant officers of administrative detail.

The Russian Press complains that the Intendance Department does not appear to have entered on its new and enlarged functions in a business-like manner. It is complained that the storehouses are badly built and fitted, and that their situation at a distance from the railway and their want of cranes entail large expenditure in cartage and manual labour. Some of the contracts issued have been unwise. A contract is said to have been granted in 1908 to a supposed benevolent institution in Warsaw, without the preliminary receipt of security of any kind, for the annual supply of 200,000 suits of uniform, 60,000 suits of underclothing, and 360,000 pairs of boots. This institution, which was in reality a commercial syndicate, sub-let the contract to a number of small manufacturers at a handsome profit. For instance, they purchased boots at 5s. 2½d. to 10s. a pair, and retailed them to Government at 14s. to 14s. 6d.

Such instances will become rare in future. The Press is doing yeoman service in drawing attention to cases of maladministration, and a determined effort is being made to stamp out peculation in all army departments and especially in that of supply. A number of Senators have been appointed to enquire into the working of the departments in various military districts, and numerous searches have taken place. The result has been that a large number of officers and officials have been brought to trial in Moscow, Kazan and elsewhere, and have received exemplary sentences.

It is recognised as desirable to purchase grain and forage direct from the producer, avoiding the intervention of the

middleman contractor. Some progress has been made in this direction. In 1898 only 2½ per cent. of the annual supply was obtained direct, and since 1903 the quantity has risen to an average of 25 to 33 per cent. The *zemstva* of certain Governments have come forward with supplies, and in 1909 purchasing committees of Intendance officers collected grain direct from the peasants.

The inspection committees of combatant and supply officers have worked slowly, and have caused much complaint in trade circles by their wholesale condemnation of stores which differed only slightly from sample. Special arbitration committees were, therefore, appointed in all districts by an army order of February, 1910, to settle disputes between the contractor and the taking over committees. These arbitration committees will be presided over by a combatant officer, and will consist of combatant officers, supply officials, and representatives of civil departments and local governments. The Chief Intendant will report on their working in December next with a view to their permanent introduction or the reverse.

In 1909, as an experimental measure for three years, district commanders were empowered to appoint committees of combatant officers under the presidency of a division commander to carry out surprise inspections of stores.

The general principles on which reform in the Intendance Department is to be developed were explained by its chief, General Shuvaev, in a speech in the Duma on the 30th March, 1910. The peace organisation is to be recast on the lines required in war. This involves decentralisation and the reduction of the staff at central and district headquarters. The district staff will be remodelled as that of an army in the field; the functions of the Corps Intendant will be enlarged, and the new post of Divisional Intendant will be created. New rules will be issued for pay, promotion and pension; the department is to be manned as far as possible by civilian officials and retired officers rather than by officers on the active list; economy is to be practised by the obvious methods of purchase for ready money in the cheapest market and by the avoidance of conditions useless to the service and irritating to the trade. Steps are to be taken to raise the general educational level of the officials and their professional status. In the latter direction the establishment of officers' courts of honour similar to those among combatant officers to settle disputes between officers and officials of the department may be regarded as a first step.

As the result of the experience of two wars, the Russian transport has evolved from the cumbersome single echelon system of the seventies, when all the transport was in regimental charge. In 1885 divisional transport was added as a second echelon, and the system of army corps supply columns, first formed in 1904, having been found to work well on service, was permanently introduced in 1906.

The impossibility of using any carts, except those of the light two-wheeled pattern in Manchuria, drew attention to the necessity of increased mobility, and consequently, in the general reorganisation of the transport in 1907, most of the three and four-horsed wagons gave place to two-horsed carts.

The cavalry division supply column has been abolished, and the stores it formerly carried will be in future carried regimentally or in the army corps supply column.

Generally speaking, the quantity of supplies has been increased; for instance, 12 biscuit rations are to be carried instead of 8, new rations of tinned meat and dried vegetables, and a reserve of oats will be carried.

It is considered that the experience of the war conclusively proved the indispensability of the travelling kitchen, and in future the regimental transport will include one for each company, squadron and battery.

RASPLATA.

("THE RECKONING.")

By Commander VLADIMIR SEMENOFF, Imperial Russian Navy.

Translated, by permission of the Author, by L. A. B.

(Continued from October JOURNAL, p. 1336.)

CHAPTER IX.

THE CHANCES OF FATE—ADMIRAL JONQUIÈRES—DRIVEN OUT AFTER TWENTY-FOUR HOURS—THE COMMENCEMENT OF OUR WANDERING ON THE COAST OF ANNAM—THE DIARY OF OUR "ODYSSEY"—THE FEELING IN THE SQUADRON—THE WORD "IMPOSSIBLE" APPEARS—THE DEATH STRUGGLE OF THE "ARMADA"—THE VICTOR SHOULD NOT BE CRITICISED—NEWS ABOUT THE JAPANESE—"DOWNHILL AT A DAILY INCREASING RATE."

ON 15th, 16th, and 17th April we coaled as fast as we could, first the men-of-war and then the fleet auxiliaries, from the German colliers.

On 15th April the hospital ship *Orel* arrived from Saigon. A curious incident took place about this time.

During the passage of the Straits of Malacca a man disappeared from the *Nakimoff*. It was assumed that he had fallen overboard and had been drowned. However, it turned out differently. He did, in fact, disappear overboard, but whether accidentally or intentionally it is hard to say. Probably the latter. A man who falls off from anywhere immediately cries out, and although the man in question may not have had sufficient breath left, and may therefore have been unable to cry out, the entire watch on deck was, at the moment of his disappearance, devoting its closest attention to what was going on outboard, the bulwarks were lined with men who were watching for every sound, for everything, in fact, so that the falling overboard of a man could only remain unnoticed if he had chosen a specially secluded spot and a specially favourable moment. Probably when he saw the lights of the town of Malacca and believed the shore to be quite near (at night one often misjudges distances) he made up his mind to desert, in

hopes of either reaching the shore or of being picked up by a fishing boat or a passing steamer. Moreover, it turned out when he was discovered he was keeping himself above water by means of a life-belt, which, according to his statement, had accidentally fallen into his hands. . . .

This incident is not a solitary one in the experience of war. Very often a man deliberately exposes his life, even commits suicide, so as to escape from that fear of death which he knows he will feel on some future occasion. In connection with this I cannot help being reminded of a case at Port Arthur, where an officer was sent back to Russia as, after taking part in several engagements, his nerves were so shattered that, with a wild look in his eyes, he assured both the doctors and his superiors "that he could not wait any longer," and would in the next engagement commit suicide at the sound of the first gun. This time fate played a trick upon the unhappy deserter. He was unable to swim to the shore (it was about 6 miles off), sharks did not devour him, but on the other hand he was not picked up by any fishing boat. Now, whether he reached Malacca or got on board any steamer—provided she was bound for any other port, *except* Saigon—he would in any case escape the fate of the Second Squadron. I must here point out that the Straits of Malacca is a much frequented part of the sea; many steamers traverse it. It was ordained that after having been eleven hours in the water a Messageries Maritimes steamer, which only passed here twice a month, picked him up and brought him to Saigon, where he was handed over to our Consul. With the next steamer which brought us provisions he rejoined the squadron, and was handed back to the *Nakimoff*. Of course he was not tried by court martial, as he gave the assurance that he had fallen overboard accidentally; he was evidently not to escape his fate!

On the same day (15th April) there arrived in Kamranh Bay on board the cruiser *Descartes* the second in command of the French Squadron in Chinese waters, Rear-Admiral de Jonquières, whose acquaintance I had already made six months ago at Saigon when there in the *Diana*. He was of medium height, spare, quite grey, but uncommonly alert and as lively as quicksilver. His age? Well on in the "forties," perhaps even fifty, but as energetic as if still a lieutenant. He was very decidedly of the opinion that Japan's attack on Russia was only the first step towards the total expulsion of all Europeans from Asia, in any case towards replacing the domination of the white races by the hegemony of a pan-Asiatic league, the common banner of which would be the flag of the "Rising Sun."

"Sometimes I don't understand the Japanese," he said, "but I am of opinion that their forward movement is justified even by their geographical position alone, but chiefly by the

fact that their advance towards Korea is something like yours towards Constantinople—matters which go back many centuries, but which are quite understood by their educated people. This is a chord, by the striking of which they could produce an outburst of enthusiasm, as with you at the times of the Turkish wars. With you it was Oleg who knocked at the gates of Constantinople with his sword; here it was Hideyoshi. From the point of view of war, pure and simple, it would have been more correct if they had attacked the line at the point of least resistance—here in the Far East we are much weaker than you. And close to us is Siam, where the heir to the throne is married to a Japanese princess; where amongst the Ministers there are two Japanese (one of them Minister of War); where the troops are armed with the Japanese rifle and trained by Japanese instructors according to Japanese methods; where the stores of munitions of war can serve equally well the native troops and those of an expeditionary corps, which would have been received with acclamation.

"What means do we possess here for defending the colony? It is simply laughable. I felt quite sure that the first blow would be aimed at us. Though possibly the Japanese, who follow the wise rule of taking into account the psychology of their possible adversaries, and who knew you as incorrigible idealists, thought, and not without reason, that you would not act as our Government have done, but would, on seeing a good ally in danger, throw yourselves on them from the north with all your might. That is quite possible, and I can understand it. What I can never understand is the irresolute, irresponsible attitude of our Government. Can it be that they are unable clearly to appreciate the fact that after you, it will be our turn? That in repudiating our original declaration of neutrality and in concurring, in part at least, in the new supplementary rules, all to please England, we are simply digging a pitfall for ourselves? In case we should find ourselves at war and these principles were to be upheld, we should be as houseless and homeless as you. In any case, pray believe that we, who are working on the spot, and who are able to take in the situation, are your true allies—not only in the sense of the friendship of which there was so much talk before the alliance was concluded (do you recollect—first, the *entente cordiale*, then the *nations amies*, and finally the *nations alliés*?) but sincerely so—and with calculated deliberation."

On 16th April the *Eridan* arrived from Saigon, the first steamer to bring us fresh provisions and vegetables. Fresh cabbage soup![1] One can appreciate that after a whole month of "hermeticals," as they were called in the mess. Lieutenants K—— and M——, as well as a ballooning expert, came also in the steamer.

[1] [The favourite dish of the Russian sailor.]

These had been at Port Arthur up to the end. Being ill, they were not made prisoners, but sent to Shanghai at the disposal of the Russian Government. As soon as they were convalescent, they felt drawn towards the Second Squadron. Their accounts were bad, so that we "begged" them (a prohibition would in our situation have been a sham) not to relate too many details, so as not to depress still more the general spirits, which were bad enough as it was.

According to their accounts Stœssel's attitude had been far from heroic. Unanimity, solidarity, there was none. The feeling in the masses, which I had personally observed even in July—that distrust of what the authorities said and promised—had got worse. With Kondratenko's death the last person really in authority disappeared. The conviction that the game was only kept up at the cost of the rank and file, that "nothing mattered, that it was not worth while," took root and spread more and more. During the last days there were not more than 5,000 men in the fighting line, yet 23,000 in all surrendered. Terrible scenes were enacted, men came to blows, were even killed—always arising out of the question: "Where have you been hiding, you scoundrel?"

The real defenders of the forts, when they returned to the town, suffering the pangs of hunger, clad in rags, could not be indifferent to the sight of the stores of uniforms and provisions which were being mustered in readiness for being handed over to the Japanese. Much was destroyed or stolen.

On the same day Jonquières went to Nhatrang Bay (about 20 miles north of Kamranh) in the *Descartes*, and returned the following day.

18th April passed quietly and undisturbed. The weather was quite settled: by day—fresh breeze; by night—calm. I went to see Jonquières by order of the Admiral, to inform him that we meant to go out the next day for a trial of the engines which had been overhauled after the long sea passage.

I had dressed myself as was demanded for such a visit. On my coat I wore the "Legion of Honour," in place of the [Russian] Order of St. Wladimir, which generally adorned it. I began by explaining that I had myself asked to be sent with this message, as I had been anxious to see once more the man who had given such friendly assistance to our ill-fated cruiser (here he interrupted me with the words: "*Ce n'est pas la fatalité —c'est de la diplomatie*"), who had rendered to myself and the other officers of the *Diana*, and eventually to the ship herself, so kindly services. If he had not succeeded in carrying out his intentions, it had not been his fault . . . (Here he made a deprecatory gesture with his hand, saying: "Hush, hush! if they were to hear us in Paris.") When I had finally reported to him respectfully the official object of my visit, he asked me, with an enormous expenditure of amiable words, to thank the

Admiral for his message, which he had not dared to expect, as in time of war the causes for sailing were a secret, and if these were being confided to him, he could only be proud of the confidence placed in him, &c., &c. He added casually that he was in direct communication with the central authorities *viâ* Nhatrang, and intended to act in accordance with the declaration of neutrality which had been made at the commencement of the war, "until. . . ." According to his opinion we were acting in a thoroughly correct manner, and the object of his presence was to protect the French territorial waters, chiefly against the Japanese, who had already violated neutral waters at Chemulpo and Chefoo.

"I know how to do it. *Qu'on tire, qu'on vise même sur mon croiseur.* Without firing a shot I will carry the French flag (*les couleurs de France*) up to the limits of our territorial waters."

Why do I love this Frenchman, who was an utter stranger to me, and why shall I never forget his acquaintance, which, measured by the clock in the ordinary manner, does not represent more than a few hours of conversation? Perhaps because for the outcast, the hunted creature, a word of sympathy said sincerely and honestly is so precious.

"*Enchanté de vous voir et au plaisir de vous revoir,*" he said as I took leave of him. "But if you should succeed, if . . . but I won't prophesy. Then our declaration, which (*Dieu soit béni*) we have not yet repudiated officially, will recover its full force, and your *Diana* will join up with your squadron. *Vous y reviendrez, mon commandant, hein?*"

"*Pour sur, mon Amiral,*" I replied, and gave his hand a hearty squeeze.

On 19th April, at 8 a.m., we went out with the two battleship divisions, only taking the *Aurora* of the cruisers. We regulated our compasses and carried out a few evolutions. The real object of the whole manœuvre was to cover the departure of our collier transports *Kieff, Kitai, Jupiter,* and *Knias Gortchakoff* for Saigon; we had pretty well emptied them, and they would only have been a burden if we had taken them any further with us. When after arrival at Saigon they had filled up with Cardiff coal from the local stores, they were to form floating depôts for our cruisers, which they were to meet at certain rendezvous to be communicated by telegraph. The *Kuban, Terek, and Ural* were to escort them to the entrance of Saigon in case any of the Japanese armed merchant cruisers were to put in an appearance.

April 20.—We coaled. At 6.30 p.m. the *Kuban, Terek,* and *Ural* got back safely. They did not see anything of the enemy. The collier transports were at Saigon.

April 21.—About noon Jonquières came on board very sad. He declared that on the demand of the French Government (our allies) we had to quit their territorial waters at once. He could

only give us a respite of twenty-four hours. What was to be done? The vanquished are always in the wrong. If Oyama had been annihilated at Mukden, we should now be living here "in peace and plenty," awaiting Nebogatoff's arrival.

Oh, this detachment of Nebogatoff! We know it now: the orders are that we are to await its arrival. "To complete our strategical dispositions," and—to trust to the Heavenly Hosts for the rest. If this detachment did not exist we should now be halfway to Vladivostok, whilst the Japanese had lost our trail. Whose fault is it? Theirs, those strategists', who had never yet heard the shriek of a hostile shell, who had even shrunk back in fear and trembling from the possibility of finding themselves in such a position! His, that K——'s who had whined: "Don't ask Rojestvensky! Send off everything you possess! Don't lose a minute, or it might be too late! Out there every ship, every gun is of value!" Truly, every ship is of value out there, but not galoshes. Valuable, too, is every gun, but not a hole surrounded by iron. It was bitter and vile to have to write these lines in my diary; it is still more bitter to read them again.

"Well, and what did I tell you?" Lieutenant S—— asked me in connection with this. "He won't return!—He is not such a fool! Do you recollect my words? Sitting in a comfortable armchair he will criticise us. Well, that need not trouble us. The terrible thing is the want of principle. That public opinion is so blind to it is humiliating. I have kept up my correspondence with St. Petersburg the whole time, I therefore know their innermost secrets. Do you know that K—— is sacrificing the whole of his convictions for 'filthy lucre'? All his tirades are a hymn of praise on [Admiral] Birileff's report of October (or November) 1904? The report in which our 'fighting Admiral'[1] (where was it that he fought?) proves the possibility, even the necessity, of sending out reinforcements in the shape of all our old rubbish? K——'s opposition was not directed against the thing itself, but against the individual. Avelan [Minister of Marine] is overthrown. Birileff takes his place—and K—— rises. He has all his expenses and losses made good. . . . Ha, ha! . . ."

I never saw him so excited before.

April 22.—Throughout the night we were employed in clearing the *Tamboff* and *Mercury*, as well as the German colliers and the steamers which had come from Saigon with provisions.

At 1 p.m. (exactly at the expiration of the twenty-four hours' respite) the whole of the men-of-war went to sea. In the bay were only left the auxiliaries and the *Almas*,[2] which even the

[1] [In English in the Russian original.]

[2] [She had been built as a yacht for the Viceroy.]

most rabid enemy could not consider as belonging to the class of fighting ships.

On board the *Suvoroff* a meeting of flag officers and captains took place.

In the Indian Ocean (on 3rd and 4th April in the General Orders Nos. 170 and 171) the Admiral had requested the commanding officers to point out daily to the officers and gun-layers how necessary it was on meeting the enemy to fire away the ammunition with deliberation and without haste; to explain to them that a senseless production of a hail of "overs" and "shorts" only pleased the enemy, and showed him how not to shoot; that loading should be very rapid, but laying had to be done with great care. But the best laying was useless if the sights were set wrong.

This order was to be read out in the presence of the officers and gun-layers, but captains were not merely to confine themselves to the reading out, but were to assemble the above daily for the purpose of making it clear to them, to inculcate the idea, in fact, of how important it was to fire deliberately and without haste. In repelling a torpedo attack at night it was necessary to keep calm, so as not to fire into our own ships. The cruisers which were covering the flanks of the fleet were not to fire inwards, except in the intervals between the ships and with the guns duly depressed. So long as a ship was under control she should never sheer out of the line, and thus cause confusion amongst the ships astern of her, as this was very favourable for the attacker. Only a damaged ship, which was no longer able to keep up the speed of the fleet, might fall out, and in such a case the ships as laid down in General Order No. 159 were to come to the assistance of the damaged ships.

(I have already mentioned this order in the introductory remarks to the report on the passage across the Indian Ocean.)

Amongst numerous other orders, that of 15th April (No. 178), which deals with the measures for repelling an attack by submarines, is worthy of notice, as well as No. 182 of 16th April, in which directions were given in the event of considerable hostile forces appearing off Kamranh Bay:—

". . . I shall then go out . . . with the main body, that is, with the two divisions of battleships, the cruisers *Zemtchug* and *Isumrud*, and the first destroyer division, as well as the cruiser division consisting of the *Oleg*, *Aurora*, and *Donskoi*. The positions of the *Zemtchug* and *Isumrud* and the destroyers are those given on the plan of battle formation in case of meeting the enemy at sea. Their task is to cover the flanks of the battle squadron against torpedo attacks. The position of the cruiser division is abreast of the centre of the battle squadron on its disengaged side, and out of range of the enemy. Their task is to attack the enemy's cruisers, should they attempt to work round the battle squadron, so as to get it between two

fires; besides this they are to cover any battleships which may have been damaged by the enemy, or are otherwise in difficulties. In such a case the *Oleg* and *Aurora* may also join in the attack, if a suitable opponent be found; the *Donskoi*, however, which is not fast enough, must not allow herself to be drawn off by such an attack, and must always keep at such a distance from the battleships that she can at all times be covered by these and cannot be cut off from them."

For the defence of the fleet auxiliaries against an attack by hostile cruisers and destroyers the *Svetlana, Kuban, Terek, Ural, Dnieper,* and *Rion,* the second destroyer division, all picket-boats armed with torpedoes, and the *Almas,* were told off. On the main body going out, all ships except supply ships were to weigh. (This was necessary on account of Jonquières, so that he could report "they have all gone.") The *Almas,* which was also to weigh, was to remain in the inner bay with the supply ships (Jonquières said "*they* can't fight"). All the above-named armed merchant cruisers were to go out into the outer roads, under the command of Captain Schein, the commander of the lookouts, and to extend in single line between Cape Kamranh and De la Prise Island. Between them and the shore would come the second destroyer division; the picket-boats were to take station on the north side of Tange Island.

"According to circumstances and the strength of the enemy, the commander of the lookouts (Captain Schein) will either await the enemy's approach, or he will stand out to sea to engage him outside the bay; in the latter case, however, he must manœuvre so as to make it impossible for the enemy to get round him and to break through to the anchorage of the supply ships. Single ships which may attempt this will be attacked by the destroyers of the second division, which are to follow out the cruisers, and at the entrance of the bay itself the picket-boats will attack, taking care not to divulge their presence until the last moment.[1]

"All steam-boats of the squadron will be hoisted out, and are to spread themselves at the entrance to the inner bay, where they are to watch for the possible appearance of submarines, which they are to attempt to destroy by ramming. If the adversary should reach the entrance to the inner anchorage, notwithstanding all these dispositions, the *Almas, Kamtchatka, Anadyr,* and *Irtysh* are to open fire on them. The three last named are to be ready to slip their cables and to advance for the

[1] There could be no question here of a violation of neutrality on our side, for this violation would already be carried out by the enemy by the fact of his attack on the supply ships lying in the territorial waters of a neutral power.

purpose of attacking the enemy with the ram, if he should penetrate into the inner bay."

Besides this, in anticipation of possible damage from Whitehead torpedoes, the Fleet Constructor P—— and his colleagues K——, S——, and L—— were directed by General Order No. 183 of 16th April, "to inspect all water-tight compartments and wing passages, and to satisfy themselves that the manhole doors are tight, and that all other appliances for ensuring the buoyancy of the ships are in good working order."[1]

All these orders, as well as others which I have already mentioned, and which contained directions as to action to be taken if the enemy were sighted on different bearings, were discussed and elucidated at this meeting. Then the Admiral communicated the hard decision of the French Government received through Jonquières. "To judge how far they are justified in making such demands upon us is not our business. If the *Descartes* were an English cruiser the thing might be considered . . . in case of need we might employ force. The English could then assemble a squadron strong enough to force me to leave. But here it is the case of our allies. And they—'beg' us to leave. I shall keep at sea, outside territorial waters, in the neighbourhood of Kamranh Bay, where I am leaving behind the supply ships and non-fighting vessels. My orders are to wait for Nebogatoff. I shall wait. I will endeavour to keep up telegraphic communication with St. Petersburg through Saigon. I shall wait until we have just coal enough left to take us to Vladivostok. If Nebogatoff has not arrived by then, there is no help for it—we go on without him. Forward! Always forward! Pray keep this always before you."

The Admiral spoke without any excitement, in a cold, business-like tone, which was not usual in him. The effect was depressing.

And now began our wanderings on the coast of Annam, the slow, wasting away of that heterogeneous collection of ships called officially "the Second Squadron."

In these sad days I used up much space in my diary. I had much too much leisure, which was relaxing in its effect. I am afraid the reader would find it difficult to follow my notes from day to day. I will endeavour to shorten my narrative as much as possible.

First for a chronological enumeration of the events of our wanderings.

As already stated, on 22nd April all men-of-war went to sea before Jonquières' eyes; in the bay there only remained the

[1] About this time the Fleet Constructor P—— visited all ships by order of the Admiral to see to the removal of all inflammable material from the upper parts of the ships, and to give, in connection with this, not only advice, but orders in the name of the Admiral.

fleet auxiliaries to which the draconic rules of neutrality could not, according to our view, be made to apply. Besides this the promise was given on our side that so long as these vessels enjoyed the protection of France's neutrality, and so long as the squadron, which would be cruising outside territorial waters, was in communication with them, we would not carry out any cruiser operations, neither confiscate ships carrying contraband of war, nor reconnoitre in any way, so as to give no cause for saying that we were using the territorial waters of our ally as a base of operations. It is surely not possible to act more correctly? We certainly thought so—so did Jonquières and the local authorities. St. Petersburg and Paris thought differently.

As I have no proofs, I will not decide whether the French were specially pressing in their demands, under the threats of England, or whether our authorities were specially ready to yield—anyhow, the decision was come to that no trace of any ship of war or commerce flying the Russian flag could be allowed to remain in French territorial waters. The news of this decision reached us on 25th April, and next morning the entire armada went to sea. Jonquières, on board the *Descartes*, was a witness of this. He accompanied us up to the limits of the territorial waters, and watched us until we were out of sight, he then steamed to Saigon with the report that "the Russian squadron had left the coast of Annam in an easterly direction; its destination was not known."

To cruise about at sea waiting for Nebogatoff, to cruise about with the entire armada and at the same time to protect the auxiliaries when our own protection was highly problematical, was simply an impossibility. The Admiral therefore came to the decision—the only one which was still open in our hopeless situation: as soon as the *Descartes*, which was going to Saigon, and the coast of Kamranh, from where one could follow our movements and report them by telegraph, were out of sight, we turned to the northward, and entered, the same evening, Van-Phong Bay. We went in with our full numbers, auxiliaries as well as warships, and anchored. It was a disagreeable place, but at least we were at anchor, and this was necessary, for though it did not permit any relaxation, it at least gave the weary crews a certain breathing time. Here, at least, the attack could only come from one side. But of that I will speak later.

The only advantage of this bay was the absence of telegraphic communication, and of any authorities. And yet—even that did not help us. Once a month a small coasting steamer comes here and buys up the catches of the local fishermen, and supplies them with all they need. Unfortunately, she reached Van-Phong Bay on the very day of our arrival, and on 27th April she sailed for Saigon, calling in at the various bays along her route.

It was therefore all up: as soon as she arrived the authorities would hasten to "request us to leave the bay."

As a matter of fact, the telegraph cables had by 29th April informed the world of our presence in Van-Phong Bay. The *administrateur*, who resided at Nhàtrang (20 miles as the crow flies South of Van-Phong) immediately received orders to transmit to us the request to leave within twenty-four hours. The honoured *administrateur* was apparently of the same opinion as Jonquières, but as regarded the ethical aspect of his duties he took the same view as the "Major" of Angra Pequeña, who will be in the reader's recollection. Not being prepared to undertake a sea voyage (as not suitable to his nature), he brought us his stern ultimatum by the land route, and owing to defective means of communication he only reached the *Suvoroff* on 2nd May, utterly exhausted, as he had travelled night and day in the execution of his duty.

There was nothing to be done. On 3rd May we once more went to sea with the entire "armada" before witnesses, Jonquières having been sent from Saigon, but no longer in the *Descartes* but in the *Guichen*. Again he was able to report that we "had sailed in an easterly direction, destination unknown." However, he informed us he would cruise for fully twenty-four hours along the coast to see if by chance we were to enter another bay not joined up by cable.

On 4th May we returned to our old anchorage. It was all so hateful (but of that later), that we did not care what happened; they were welcome to accuse us of having broken our word.

On 5th May, the "Master of the Fleet," Colonel F——, and I started off in the steamer *Russ*[1] to inspect the neighbouring bays which might be suitable as anchorages, but which were outside telegraphic communication, and so formed that passing steamers could not see the squadron from seaward, and would, therefore, not be able to give away the secret of our asylum.

We visited Vung-Ro and Port Dayotte; the latter was very suitable. The only drawback was that it was badly surveyed and charted. There might be unpleasant surprises in the shape of coral reefs rising up sheer from the bottom. We hesitated before going there in view of the news received from Nhàtrang (to which place a destroyer had been sent, as it were, coming from sea) that a typhoon was approaching and expected to pass in our neighbourhood. It was therefore a case of *force majeure*. The right of taking refuge on the approach of a typhoon cannot be curtailed by any supplementary paragraphs of the declaration of neutrality. In fact, a heavy swell was

[1] By an order from the Admiralty, which reached us at Madagascar, my position in the squadron had been "legalised" by appointing me navigating officer on the Admiral's staff—a mere matter of form, seeing that there were already three navigating officers on the staff, who were all senior to me and more experienced.

already coming into the bay, and the cruisers on look-out had a bad time of it, although the typhoon passed some way off, much further north.

Still, our present anchorage was openly in view of all passing vessels. Although the local authorities were full of benevolence towards us, we received, on 7th May, the confidential information that our return to the neutral waters of Annam was being discussed in every newspaper in the world. Japan, it was said, was incensed, and making protests; England was supporting her energetically; Paris, totally intimidated, was launching thunderbolts against the local authorities; St. Petersburg, still more intimidated, had said: "It is not my fault! The horse is no longer under my control. I am powerless, and know nothing. Rojestvensky is acting independently. This is his affair. Fetch him out if you like—we wash our hands in innocence."

At the same time—"strategic dispositions . . ." Nikolai Ugodnik . . . Seraphim Sarovsky . . .

How hard this was to bear! How heavy was one's heart!

On 8th May we despatched two pairs of cruisers—*Rion* and *Zemtchug*, and *Dniepr* and *Isumrud*—to meet Nebogatoff, as it became known that he had passed Singapore at 4 a.m. on 5th May.

On the morning of 9th May we again went to sea. Jonquières in the *Guichen* again watched our departure.

Oh, Heavens! Why was this disgrace brought on us? We were not allowed to rest anywhere. We were hunted out of every place. The veritable "wandering Jews."

Jonquières, our sincere well-wisher, looked on, then cruised up the coast so as to be able to report at the end of twenty-four hours: "They sailed to the eastward—destination unknown."

During the forenoon our scouts came back without bringing any news of Nebogatoff.

About 11 a.m. we took in a wireless message from the *Monomak* which was reporting something to the *Nikolai*.[1] About noon we were in wireless touch, and at 3 p.m. we joined hands with the "flatirons and galoshes," which bore the sonorous title of "Special Division of the Second Squadron of the Pacific Fleet." Of the impression produced by this meeting I will speak later. Here I only give the chronological narrative of events.

At 5 p.m. Nebogatoff came on board the *Suvoroff*. He discussed the further dispositions with the Commander-in-Chief. We were ready, but Nebogatoff had to coal, overhaul his ships, after the long sea passage, to study the numerous orders which had been issued in the squadron in the event of meeting the enemy. He was directed to the secluded Port Dayotte, already mentioned. He went there. We remained at sea.

[1] [Two of Nebogatoff's ships, the latter his flagship.]

On 11th May we tried to fill up with coal, having expended much of it. But we could not manage it, the swell being too heavy. We therefore decided to make for Van-Phong. We were in hopes of being able to fill up with coal before we were requested to leave. We worked like mad all night. Early on 12th May we left the bay. It had all been done in one night. Without boasting one may well say that it was not a bad performance.

Cruising about at sea we waited until 14th May, on which day Nebogatoff's division rejoined after having replenished stores and prepared generally for a continuation of the voyage.

At last! Heaven be praised!

It would appear that this was the unanimous sentiment.

Having now described the events, I will endeavour to indicate briefly the general feeling on board the ships at the time of their involuntary wanderings on the coast of Annam.

What I had dreaded most was that the chord which had been stretched too taut would not hold out, and if it did not snap, would at least give. This dread proved to be well founded on the very day on which it became known that we had "received orders to wait."

One had the feeling that after working at such extreme pressure the whole organization only just pieced together would collapse, and that in the place of the squadron welded together at last we should once more have only an "armada" to deal with. We had exhausted our strength. This was what we felt. Of course I may be met with the reply: Do not judge others by your own feelings; give us facts for the statement that the orders to wait for Nebogatoff caused all the remaining energy to evaporate; prove to us that the exhortation to trust above all in the Heavenly Hosts instead of raising our spirits depressed them.

Very well, here are some facts.

Even on 16th April the Admiral found himself obliged to modify the dispositions he had made for the safety of the squadron at anchor—not with a view of protecting it still more efficiently, but simply because it had been proved to be impossible to adhere to the very suitable arrangements he had made.[1] It turned out that the cruisers, destroyers, and picket-boats could not be made to carry out their duties in two reliefs only. The captains reported that the crews were exhausted, and that there were frequent breakdowns of machinery, chiefly due to carelessness. And only a week ago they did this work unflinchingly and declared their readiness to continue it until Vladivostok was reached!

On 17th April (General Order No. 204) the number of destroyers to be sent out on patrol duty were reduced to two.

[1] General Order No. 201 of 16th April.

It would appear that even Admiral Rojestvensky had now realised that the dictionary contained the word "impossible."

It is difficult to give the reader a clear picture of the mood which prevailed among the men of the squadron. It seemed to me that it might perhaps be expressed as follows: We are not allowed to carry out now at once what we are able to do; by the time we get permission for it, it will be too late. Those at the other end of the old world, blinded by their own conceit, want to direct us, believing themselves to be better able to judge than we, who have penetrated to the very borders of the Land of the Rising Sun. And we are powerless in the face of their decision! But our duty as sailors comes first. When the order comes we shall not hesitate to stake our lives. We are without fear, but also without hope. It is false to say that fate is blind; fate sees very clearly, and when it compares our "armada" with the battle fleets of Japan, it will come to its decision very speedily.

All were so weary that they begun to lose heart, and were only kept up by the strong will and the firm determination of a few individuals.

On 20th April (in General Order No. 194) the Admiral said:—

"The strenuous work of eight months spent in perfecting the wireless telegraphy in the squadron ended with the following results: Yesterday, 19th April, whilst the battleships were at sea, a special order was to be transmitted to the commander of the fleet auxiliaries. The flagship called up the *Almas*, then 15 miles off, for one and a half hours, without getting any response; then the flagship called up the *Oleg*, also without any result. Apparently the *Zemtchug*, *Isumrud*, *Dniepr*, and *Rion* were equally inattentive as regarded the wireless service, as they should have informed the ship concerned by signal that she was being called up, and have reported the fact that her apparatus was not working properly. To-day, at 2 p.m., there should have been wireless messages from the cruisers *Kuban*, *Terek*, and *Ural*, which were approaching the squadron.

"The flagship did her utmost to take in the prearranged messages, but got nothing. This condition of the *Suvoroff's* apparatus is a very sad fact, but still more sad is the fact that not a single apparatus in the whole squadron took in the *Kuban's* message and communicated it to the flagship. To-day the *Suvoroff* tried in vain to call up the *Rion*, which was out patrolling. Is the captain of the *Rion* quite clear in his mind as to how useless his patrolling service is if his wireless apparatus is not in working order?—Admirals and captains! it is time to take the most energetic steps!"

Of course the Admiral was not only justified, but in duty bound to issue orders like these, but did he himself believe in

the possibility of his demands being complied with? That is the question. I do not think he did.

Again insubordination showed itself, discontent began to break out over the most trifling matters; offences against discipline (which had almost ceased for a time) became more frequent. Whilst clearing steamers, which had brought provisions from Saigon, there were scenes which bordered on open robbery; the working parties stove in wine-casks, broke open cases with liquor, became drunk and uproarious, and insulted even the officers who tried to restore order.

Notwithstanding the original assurance that the word "impossible" did not exist, its effect became more and more apparent.

On 20th April the Admiral said in General Order No. 196:

"So as to ease the work of the destroyers, and to give the captains the possibility of keeping their vessels in a complete state of readiness, two patrol boats will be withdrawn. . . . Yesterday a destroyer on patrol duty lost an anchor; that means that she was either at anchor, or had the intention of anchoring, which is quite incompatible with the duty confided to her. . . ."

With the commencement of our "wanderings" matters went downhill at a daily increasing rate.

By day we lay with engines stopped and watched the horizon unceasingly (for any smoke which might appear), as well as the surface of the water in our vicinity (for the periscope of any submarine which might be approaching). At night we steamed at 3 knots, a speed just sufficient to maintain our formation, and in the event of a torpedo attack we were to increase to the speed necessary for handling the squadron. Throughout the twenty-four hours the *personnel* was kept at the highest tension; watchfulness, resourcefulness, coolness, resolution—all these were demanded. And that from men who had already done six months' cruising through the tropics under war conditions.

The exercises were continued automatically. I remember it very distinctly, but in my diary I cannot find any notes on the subject. They were lifeless exercises, carried out according to rule, as a part of the weekly routine of drills. The war game, which had been so engrossing, the solving of tactical problems in the mess (on paper), which had taken place throughout the voyage without interruption, tacitly came to an end. The naval handbooks, the essays on questions of naval tactics and strategy, works on naval history, which were formerly so much in request that it was hardly possible to get hold of them, now remained untouched. In their free time the officers read chiefly—do you know what?—cheap novels of the fantastic kind. . . . Especial favourites were the publications of Fr. Kryanovsky (Rochester), which were written in the manner of spiritualist revelations. How

pleasant it was to forget, even if only for a while, the realities of life, and to allow oneself to be engrossed by the wonders of the "Magician," of the "Elixir of Life," of "Life in Mars," of the "Adventures of the Hungarian Count (I forget his name) —a Vampire," etc., etc. Laugh if you will and can, but facts remain facts; it shows that such an existence will reduce grown up and thoroughly sensible men to a condition in which they have only one desire, one idea: to get away as far as possible from the actualities of their surroundings.

In the midst of this deep demoralisation, the one thought shone out ever like a beacon: The Admiral is always the same! He's not weary! He'll get us along! He'll pull it off! He still has confidence!

This our people believed. But were they right? Could they say that they had searched the innermost recesses of his heart—that they knew him? They were at least willing to believe it, and they placed their fate completely into his keeping.

It was like a half black, half red mist, a fever, this death-struggle of the squadron, as I have called it before. From time to time (it seemed to me and not to me alone) that even the Admiral gave himself up to that fatal power of attraction of the open abyss. . . . Only shut the eyes . . . a false step . . . and the end is reached. How good! And over so quickly!! . . . .

Can one find any other explanation for these night alarms —these exercises "in repelling torpedo attack at night"—which used to be suddenly carried out on his personal order in the depth of the dark nights, when we were crawling along the coast of Annam at 3 knots? The search-lights of the squadron produced an illumination which could be seen at least 50 miles off, and which would indicate our presence and whereabouts very clearly to the enemy, if any happened to be in the neighbourhood.

"What is the matter with him? Surely this is provoking our fate!" I said to Lieutenant S——. "For all one can tell the Japanese destroyers will find us by this illumination. In fact, we are showing them the way ourselves. We are regularly calling them up!"

"And what if we do call them up?" he replied, giving my hand a nervous squeeze. "How the end comes is a matter of indifference. Possibly it is better so. . . . They won't sink the entire squadron. Something will be left over. Ha, ha, ha! but the hope of beating and annihilating the enemy with the kind assistance of the Heavenly Hosts will now have to be given up, whether we like it or not. But no! It is quite clear—the Japanese are acting deliberately. They are not going to trouble themselves about trifles; they go in for the whole. They only deal 'wholesale.'"

One should not criticise the victor. Yet I venture to maintain that if this "wholesale" business had not succeeded, if

a continuation of bad weather (such as seemed quite probable at this time of the year) had prevented a decisive battle from being fought in the Sea of Japan, or if fog (also very frequent during this season) had enabled the squadron to get through to Vladivostok undetected by the enemy, Admiral Togo would have been severely reprimanded for not having made use of the time of our wanderings on the coast of Annam for torpedo attacks, for not having even made an attempt in that direction.

What considerations were, in truth, hampering at that moment the famous spirit of enterprise of the Japanese?

I could have wished that our patent strategists at headquarters, who were so fond of prophesying after the event, had solved this riddle.

These strategists accused Admiral Rojestvensky of neglecting his scouting service. I will not give an opinion on this point, which History alone will be able to answer without bias, provided those who write it have had access to all the secret archives. Were these gentlemen so badly informed, or were they deliberately deceiving public opinion so as to throw the whole responsibility on Admiral Rojestvensky, whilst they, the instigators, were cleared? I cannot judge of this with certainty. I only wish to point out that in accordance with the promise we had given, we were unable to carry out cruiser operations during our stay off the coast of Annam. Paris feared above all that the suspicion, or even a shadow of one, might arise that we were using the territorial waters of France as a base of operations. From St. Petersburg *we* received directions, the *French* the assurance, that nothing of the kind was permissible. We had to obtain all our intelligence by means of secret agents who were sent here and there in specially chartered steamers. We did all that was possible.

I may say not without results. We found out for certain that during the ten days or fortnight preceding our arrival in Japanese waters, Japanese cruisers, accompanied by destroyers, had carefully searched the bays along the coast, not only of Annam, Tongking, and Cambogia, but also of Siam. The uninhabited, almost virgin, islands of the Gulf of Siam, amongst which there are numerous suitable anchorages, were also visited by them. After that they seemed to have disappeared off the face of the earth. A vague trace of them was discovered not far from Singapore, in the Rio Straits, off the coast of Borneo. They were probably waiting for us in the Straits of Sunda. After our successful passage of the Straits of Malacca, they commenced moving about again in various directions. They went to North Borneo, and in the first days of April they assembled in the roads of Mopo (Pescadores), the only anchorage belonging to them in these waters, as there is not a single bay in Formosa suitable as an anchorage for a large fleet. It became known that at Mopo troops and siege artillery had been landed, fortifications thrown up in haste, the approaches to the

anchorages blocked by mines—in a word, that a temporary base had been created there. Then again all news ceased—naturally not without the friendly co-operation of that good ally, England, who has nearly all cables in the East in her hands. It was once more as if they had disappeared into space. They only reappeared within the ken of our agents after Nebogatoff had passed Singapore. Were they by chance just a little too cunning on this occasion? As regarded us, everything spoke in favour of our going through the Straits of Sunda; diplomatic negotiations with the Dutch Government, the despatch of the colliers to Lampong, etc., etc.—all this, though done in secret, could not remain unknown to the world at large, how much less to the Japanese. The Admiral had not communicated his intention to go through the Straits of Malacca to any one, not even in the most secret cipher telegrams. The secret was preserved. Nebogatoff, on the other hand, reported, on starting from Jibuti, to the Naval General Staff (of course in secret cipher) that he intended going through the Straits of Malacca. The result was that all newspapers (in the English colonies) reported the route with certainty, and even competed with one another in their calculations as to the precise date on which he would pass Singapore. Possibly a *pari-mutuel* was set up for the purpose. These noisy manifestations looked so much like a challenge, that the Japanese were justified in not attaching any credence to them. They argued quite correctly. Rojestvensky himself spread the report that he was going through the Straits of Sunda, but went through the Straits of Malacca. Nebogatoff, in trying to reproduce the same trick (but less skilfully), almost openly advertises his intention of going through the Straits of Malacca, but naturally he will go through the Straits of Sunda. There we shall find him. The calculation in itself was quite correct. But—even the cleverest can make a mistake. No doubt in this case Nebogatoff had been one too many for them.

These two failures, one close on the other, seemed to hit the Japanese hard. After Nebogatoff had passed Singapore they hurriedly showed themselves once more at the Pescadores, but did not remain there long, gave up the whole business, and made off to the northward. The latest information received by us placed their main body, almost their entire fleet, at Masampo (25 miles to the westward of Fusan—an excellent anchorage). A certain number of destroyers, as well as the armed merchant cruisers *Hong-Kong* and *Nippon*, carrying submarines, were in southern waters. As to that our information was such as not to admit of any doubt. And yet they undertook nothing against us, who were playing the "wandering Jew" on the coast of Annam. Why? I do not think that we shall find out the true causes of their decision for a good while. But if it is permissible to admit that they really believed in our strength, that they dreaded us. . . . How singularly favourable was that moment

for concluding an honourable peace! By whose fault was it missed? History will answer this.

It was so easy at that time to damage our squadron, if not to annihilate it completely.

As I have already said, with the commencement of our wanderings matters went down hill at a daily increasing rate. In proof of this I propose giving extracts from some of the General Orders of the time.

"Last night (General Order No. 219 of 3rd May), when the squadron was steaming at a speed which was half what the boilers in use were capable of developing, the cruiser *Admiral Nakimoff* and the battleships *Imperator Alexander III.*, *Orel*, and *Sissoi Veliki*, increased their distances from the next ahead to twice, even three times those prescribed. I request the captains of these ships not to overlook the fact that by acting thus in action they might place the whole of the ships astern of them in a very awkward predicament. Yesterday during the night alarm the searchlights of the battleships *Sissoi Veliki* and *Navarin*, as well as of the cruiser *Admiral Nakimoff*, did not project any beams of light, but merely a kind of luminous mist, which enveloped the whole neighbourhood. This shows how little attention is paid towards keeping the searchlights in working order and adjusting them properly. The entire cruiser division continued to work their searchlights, and consequently to fire their guns, after the flagship had made the signal to cease fire and to extinguish searchlights, by raising one of her beams vertically. In this way one usually fires on one's own ships."

"On 5th May (General Order No. 223 of 6th May) the *Kuban*, whilst on patrolling duties, sighted two destroyers, which, on discovering the cruiser, hoisted French colours and steamed away at high speed. The captain of the *Kuban* did not consider it necessary to make sure whether they were really French destroyers. On the evening of the same day the captain of the cruiser *Dimitri Donskoi*, on the same service, reported by wireless that he could see a searchlight beam to seaward of him; as a matter of fact, searchlight beams were observed from the flagship in the bay, over the high land, against the sky, and the direction in which these were seen coincided with the bearing of the station of the lookout cruiser *Ural*. From this it can be concluded that the *Ural* (unless she was working her searchlights herself) was in a better position to observe these strange lights than the flagship, and also the *Donskoi*, as she was nearer to the source of the light than the latter. The captain of the *Donskoi* did not make up his mind to ask the *Ural* whether she could see the light in question, and the *Ural* herself made no report on it by wireless. When the flagship ordered the

Donskoi to enquire from the *Ural*, the latter never took in the call of the *Donskoi*. The *Donskoi* did not think of using the searchlight for communicating with the *Ural*, but left her station for the purpose. After she had thus moved away she was no longer able to take in the flagship's wireless messages, and thus ceased to act as linking ship between the *Ural*, the picket-boats, the destroyers, and the squadron at anchor. It therefore took nine hours (from 8 p.m. to 5 a.m.) to get an answer from the *Ural*. The impression produced by this manner of carrying out the lookout and patrol service by our cruisers on 5th May is very bad; it proves that there is a complete lack of initiative, and that there is no just appreciation of the situation and its requirements. What makes this bad impression still worse is the fact that on 5th May there was no chance combination of unfavourable conditions. Incidents like the above are of almost daily occurrence."

Thus the Admiral wrote, and thus he unquestionably had to write in his General Orders. But in this case I consider it to be my duty to say a word in defence of the *personnel*.

"Lack of initiative, of appreciation of the situation, of knowledge"—all these were facts. But whence could any one have obtained all this if he had not been trained up to it? In individual cases, though never for any length of time, it had been possible to make up for this lack of previous training, to a certain extent, by high enthusiasm, by the *personnel* being made to exert itself to its utmost—often to an excessive, or even senseless, extent. But human power of endurance is not unlimited. In ancient times, when fire-arms were still unknown, the bow was only bent just before battle, and afterwards it was eased up again, allowed to rest. But in the Second Squadron there was no rest.

Those high spirits which prevailed in the early days after our arrival in Madagascar vanished again during that two months' stay in Nossi-Bé.

A second, if possible, still more powerful wave of enthusiasm, which was the result of the successful passage of the Straits of Malacca, was also not utilised. If I may use a simile, I would say that it was perhaps still higher and more steep than the first one, but precisely on account of its strength it melted away still faster, still easier. It melted away as it met with no obstacle against which it could have hurled itself with all its might; it melted away like every wave which, after having lost its crest of foam, becomes merged in the gentle, powerless, dead swell. . . .

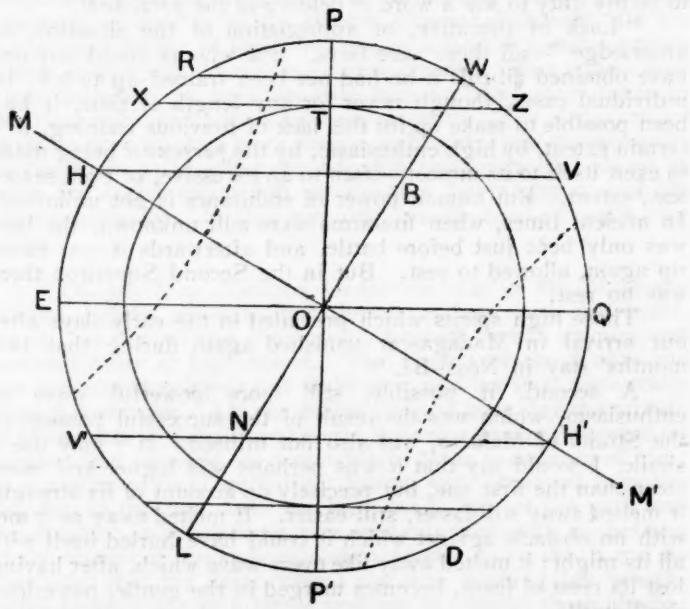
(*To be continued*).

THEORY OF THE TIDES.

By Commander J. F. RUTHVEN, Commodore of the "Orient" Line.

PART II.

ON p. 208 of the *Admiralty Tide Tables* (1902) we find the following note on the tides of Burrard Inlet:—"From September to March the day tides are highest, the reverse occurs during the other months. The diurnal inequality is great, causing apparently but one tide in the 24 hours on many days. The tide has the peculiarity of rising to nearly the same level at the higher high water whether it be springs or neaps, whereas



the level of low water varies in the usual manner." And on the same page:—"The tide, so far as ascertained at places in the Strait of Georgia and to the northward as far as Seymour Narrows, has the peculiarity of rising to nearly the same level at the higher high waters whether it be springs or neaps,

whereas the level of low water varies in the usual manner." These places are between Vancouver Island and the mainland of British North America in latitude 49°— 52° N. and longitude 124°— 129° W., and are within 10° or 12° of the parallel of single-day tides when the moon has high declination, and so our theory would predict very great diurnal inequality. I will now endeavour to make it clear that what is a "peculiarity" by the dynamical theory is explicable by, and a necessity of the new equilibrium theory. Let us compare the proportionate values of spring and neap tides along the parallel Cos.$^{-1}\frac{1}{\sqrt{3}}$ =Lat. 54° 44′ N., at summer solstice and autumnal equinox. If in diagram the inner circle be drawn with radius O T= nat. sin. to radius O P, it will just touch the parallel X Z, which will represent that of 54° 44′, a very few degrees north of the localities mentioned in the explanatory notes. This inner circle (lunar circle of equal altitude 35° 16′) will represent that of mean level[1] at *equinoctial springs*, or when the moon and sun are both over O. The outer circle will then represent that of lowest water. Let H M be the direction of the moon at *summer solstice* (21st June) and at new moon it will also nearly enough for our purpose be the direction of the sun. Then the dotted lines will be the circles of mean level,[1] and L W that of lowest water. R W will be the parallel along which it is impossible there can be more than one true tide in the lunar day. X and Z are both 54° 44′ from the equator, and so at solstitial springs X is 26° from the apex of the cone of the day tide at H, whilst Z is 83° from H′ and therefore in almost lowest possible water. It is clear that at this new moon the day tide at X will be large, whilst the night tide at Z practically vanishes. At most the elevation at Z can be little above lowest water, and there will be thus at solstitial new moon a great diurnal difference in the elevation of the day and the night tide, amounting practically to only one tide in the lunar day.

Let us now see what the neaps will be. A week after new moon that luminary will be over O on the equator, and her high water will vanish at T, which will have as far as the moon is concerned water at mean level. X and Z will both be in her lowest water. As a place on this parallel is carried by rotation through these points, it is plain that the high waters at T and opposite T (along the parallel) will be but relative, that is as compared with the depressions at X and Z, which are both on the circle representing the moon's lowest water. But the depression at X will not be nearly so low as that at Z, because the sun will have scarcely moved perceptibly south during the week and will be still exerting his influence over H,

[1] For the moon and approximately for the sun. The circle of lowest water is the same for both luminaries when sun, moon, and earth are in line.

and so producing solar high water at X, whilst Z is so far from H′ as to be almost in solar low water. The two high waters at and opposite T will be equal, but the depressions will be unequal. The high waters being but relative, will this neap tide be less than the spring day tide and greater than the spring night tide. What was practically a single-day tide at springs along the parallel of 54° 44′ has given place at neaps to two equal high waters of moderate elevation in the lunar day with two very unequal low waters.

Now let us see what the tides will be proportionately to one another (spring and neap) at the autumnal equinox. About 21st September the sun will be over the equator at O, and the moon, if new, will be in the same direction between the sun and the earth. The equinoctial spring tide will, therefore, be highest on the equator, and its elevation will vanish at T. From T to the pole there will be depression. Thus at equinoctial spring tide there can be no elevation above mean level along the parallel X Z. There will be two low waters at X and Z (lowest possible), and therefore a relative high water at T and opposite T, but the highest water will not be above mean level. So much for the equinoctial spring tide along the parallel 54° 44′.

What of the equinoctial neap tides? A week before equinoctial new moon, just considered, she was entering her last quarter and 6 hours west of the sun, which was practically over the equator, whilst the moon was in the direction H M The moon was, therefore, producing her highest water at H, and high water (though, of course, not so high) at X, which is 26° away from the apex of her tide. At Z the tide produced by the moon may be considered as practically at low water. The sun's tide almost vanishes along the circle through T. and the circle P Z Q P′ E gives his lowest water. The tide at X is therefore the moon's tide at a point 26° away from her, diminished by the depression produced by the sun's influence. Practically there will be but one high water along the parallel of 54° 44′ in the lunar day, but its elevation will be greater than that of either of the semi-diurnal equinoctial spring tides and higher than either of the equal high waters at solstitial neaps.

The parallel of 54° 44′ has been selected to simplify the demonstration and the better contrast the two extreme cases of no declination and highest declination for the tide-producing luminaries, but it is obvious that what is true for this parallel must approximate very closely to the theoretical tides of the localities mentioned in the Tide Tables, which are only from 2° to 5° south of 54° 44′. To those who are accustomed to see spring tides greater than neaps at all seasons of the year, it may seem an astonishing result to find practically a single high water in the day at solstitial springs, and the same at equinoctial neaps higher than the preceding and following springs,

but it seems theoretically necessary unless counteracted by local conditions. If this be so, it is clear that the notes quoted describe the tides as they should occur, and there is no peculiarity to explain. If, on the other hand, our views are false, it must be considered a strange coincidence that our theoretically necessary tides should agree as far as obstructions permit with the facts of observation.

It is quite certain that the tides of Burrard Inlet and the Strait of Georgia cannot be accounted for on dynamical principles, and before Moxly's explanation twelve years ago mariners navigating these waters were at a loss to know what to expect, whether the neap would change places with the spring tide as regards height, or whether to look for two high waters or one in the lunar day. Ten years ago the Canadian Government commenced to publish tide tables for this coast, which have been annually improved as observations accumulate and are analyzed, and now under the able direction of Dr. Bell Dawson they seem to leave little to be desired as practical guides. The tides themselves are, however, no longer "anomalous," but are the true equilibrium tides interfered with as they must be by natural obstructions.

Let not the reader lose faith if some of these published and valuable records seem at first sight to contradict our theory, but rather, when he has the opportunity, endeavour by comparing theory with actuality, to find out the cause of discrepancies and how obstructions produce them. With a true theory, now that systematic observations are being taken and analyzed, it is only a question of time for a careful comparison of times and heights at various stations along the coast and speed of streams through connecting channels, to unravel the skein and reveal Nature's secrets here, as we have done in so many other simpler cases, where till comparatively recently the tides were called "anomalous." That actual and relative heights as well as times may, owing the effect of local surroundings, be expected to differ from those predicted by theory for a world free from obstructions, is indicated by the fact that on 26th March, 1910, when the moon and sun were over the equator and quite incapable of producing any diurnal inequality whatever, the tables for Vancouver, B.C., showed 16 inches inequality in a rise of 11 feet. This, of course, like the extra 7 feet of rise, must be entirely due to local causes. The same thing occurs on the British coasts. Opening the Tide Tables for 1902 I find that at Devonport on 17th September, with the luminaries over the equator, the difference between high waters was 10 inches and between low waters 11 inches, which is clearly not due to declination. On 20th June the tide which should theoretically be considerably the lower had 6 inches more elevation. The reason for this will appear presently. Another apparent anomaly and contradiction to rule, is that the day tides at Burrard Inlet are highest in winter and night

tides in summer, but that is only because they have to search their way over shallows for such a long distance from the coast. The same way the tides that at Halifax and St. Paul's Island, in the entrance to the Gulf of St. Lawrence, conform to our rule, require nearly another 12 hours to reach Quebec and considerably more than 12 hours to arrive at Montreal, and so the coast day-tide becomes a night tide, and the night tide belongs up the river to the following day.

It is worth while to tabulate the foregoing results for easy reference, because they apply not only to the places named, but to all others a few degrees either side of latitude 55° N. and S. as far as the permanent obstruction of land and uneven depths, and temporary interferences, such as abnormal atmospheric pressure and wind friction, will permit.

At Solstice.	Springs	Great diurnal inequality, so that there is practically only one high and one low water in the day—high water highest possible on that parallel: low water nearly lowest possible anywhere; of long duration with slight rise at half-time.
	Neaps	Two equal high waters (lower than spring day tide and higher than night tide) not much above mean level, with two very unequal low waters, one being largely counteracted by the sun's attraction and the other coincident with solar low water.
At Equinox.	Springs	Two equal high waters not much above mean level, with two equal depressions to lowest water possible. Range not great.
	Neaps	Great diurnal inequality, amounting to practically one tide in the day. As the sun is subtracting from the lunar tide, the elevation will be less than at solstitial springs, but higher than at solstitial neaps, or equinoctial springs. Low water nearly lowest possible.

The Admiralty Tide Tables tell us that at some places on the east coast of British North America, diurnal inequality affects low water more than high water. The reason now is quite clear. The sun modifies one low water and accentuates the other at solstitial neaps, and for some time before and after to a lesser degree. Between solstice and equinox intermediate conditions and results will obtain, inclining towards one or the other, according to the position of the tide-producing luminaries.

If the critic objects that our diagram does not explain the tides about the entrance to the British channels, where there is little difference between the elevation corresponding to the moon's passage of the upper and lower meridians, my reply is, that the tides of the North Atlantic are largely, and perhaps

in some places principally, derived from those of the South Atlantic, and so only partially conform to the differential pressure theory. As far as the *true* tide is concerned it is the same as if there was continuous land round eastward from the western shores of Europe to the eastern coast of America. The whole level of the North Atlantic will, at regular intervals, be raised by the derived tide travelling from the southward as a free wave for thousands of miles over uneven depths, and consequently at variable speeds, especially on the eastern side, where islands as well as sloping sea floors obstruct its path. It is now generally agreed that this derived tide is the cause of the enormous rise in the Bay of Fundy, and I believe that a closer analysis will show that it counteracts or almost annihilates, and in some cases reverses, diurnal inequality in the tides which we maintain misled Newton and Laplace. If I put this forward more as a highly probable suggestion than as an assertion, it is only because I have not sufficient evidence at hand to prove it indisputably, but I think I can convince the reader that it is almost a certainty.

To begin with, the fact remains that in similar latitudes in other oceans, where any derived tide is so small as to be practically a negligible quantity, diurnal inequality is almost universal. Reasoning by analogy suggests that it would be equally regular in north-west Europe if there were not a compensating wave or equalizing pressure from some direction that modifies it and in some places annuls it. This wave can hardly come from the east or the north, nor yet from the west, towards which the *true* tide-wave must be travelling. There only remains the south and south-west, the direction that the derived tide-wave comes from.

Again, as tidal observations become more numerous, it should have been, and is now evident, that the few particulars available as practical guides to Newton and Laplace were not typical of Atlantic tides generally nor even of those of western and north-western Europe in particular. More than 70 years ago Whewell found that diurnal inequality was quite general, if small, on the west coasts of Spain, Portugal, and France, except, of course, when the moon was on or near the equator. He found that it obtained on the coasts of Cornwall and Ireland for part of the lunation, after which it suddenly vanished. There was some diurnal inequality in the North Sea, whilst on the other side of the Atlantic it equalled in the Bay of Fundy some of the differences between springs and neaps. He found that maximum inequality corresponded to maximum declination, which the equilibrium theory predicts, and that inequality of heights depends partly upon local circumstances, which agrees with our contentions as to the effect of obstructions.

Whewell's examination showed that in the southern hemisphere, when the moon was south of the equator, the highest equilibrium tide (he had to call it an equilibrium tide because

the dynamical wave was incapable of producing inequality, was that corresponding to the moon's upper meridian passage, whilst when she was north of the equator the highest tide was when the moon was on or near the lower meridian, which is in accordance with theory for the ideal world. He observed, however, that in the northern hemisphere these conditions were reversed, and that the highest equilibrium tide when she had northern declination corresponded to the inferior transit and when she had southern declination to the superior transit of the moon. This is contrary to the theory for the ideal world, and is doubtless in my opinion, as I hope to show the reader, due to the influence of the derived tidal wave from the southern ocean.

Whilst we deny that there is any oscillation in the forced wave of the true tide which travels eternally in the same direction, this derived tide is a free wave, whose speed is regulated and limited by the depth of water, and will oscillate inasmuch as it must reverse its direction of translation in the South Atlantic, when the region of depression passes the southern extremity of the African Continent. How far this reversal will affect the speed and level of the wave already well on its way towards the equator observation rather than theory will eventually decide. But as observations become multiplied at stations, especially the islands along its path, data ought to be forthcoming for an exhaustive analysis, which by separating it from the true tide, would indicate their respective parts in producing the times of high water as we know them. Whewell considered that he detected a connexion between the tides of Liverpool and those of the Southern Ocean 6,600 nautical or 7,600 English miles distant, allowing for the time it would take a free wave to travel this distance. He stated that it was not possible to give the law of diurnal inequality that at one season of the year made day tides greater, and at another less than night tides. This is a necessity of our theory, and as I have already shown (in Moxly's tides) quite simply explained by it.

That the free wave does receive some check (less in proportion as its distance from the Cape increases) from this oscillation and the passage of the depression across the South Atlantic Ocean I think highly probable, for the following reasons. The higher of the *true* lunar tides in the North Atlantic must, as elsewhere in that hemisphere, with northern declination, be that nearest the moon, when the highest tide in the southern hemisphere is 12 hours to the eastward (or westward). Now this anti-lunar high tide would arrive off the Cape some 12 hours later, when the moon both there and at Greenwich is near the lower meridian. If, now, the free wave it generates took only 12 hours to reach the neighbourhood of Ushant, it would meet the moon at her next return to the upper meridian, and thus increase instead of reduce the amount of diurnal inequality. But Whewell tells us that the highest

tide when there is any difference corresponds to her inferior transit, so that the derived tide must take nearer 24 than 12 hours to cover the distance and bring such a volume of water to swell the *smaller true tide* that its level is raised to equal, or even exceed that of the larger one, and so diurnal inequality is either annulled or reversed.

The problem is complicated by the fact that it is not a single wave that is generated, but rather a series of waves commencing when the surface level west of the Cape first rises above that of the ocean to the northward and continuing until the level ceases to rise. Each new wave may be conceived to give a fresh impulse to those in front of it and so diminish the retardation due to surface friction.

The average depth along the eastern side of the Atlantic does not much exceed 2 miles (it is deeper in the South Atlantic), the appropriate wave speed for which is 400 miles an hour if unobstructed. But, besides the retardation caused by friction and the periodic fall of the water south of the 35th parallel of latitude, every portion of the wave towards the Bay of Biscay, and for 200 or 300 miles west of Cape Clear passes through a screen of islands. If we could move the Cape Verde Islands N. by E. 1,100 or 1,200 miles, they, with the Azores on one side and Canaries, Madeira, &c., on the other, would form a barrier like a partially demolished gigantic breakwater across the path of the wave, which would be more or less broken up and checked passing through the comparatively shallow gaps between the islands. The check will hardly be much less because different sections of the wave receive it at different stages of their career. It is true that a portion of the wave passing west of the Azores in deeper water will outstrip that through the islands, and assisted by rotation and a rise of level be deflected towards North-West Europe, but the general effect on the whole wave will be a considerable reduction from its South Atlantic velocity of about 450 miles an hour. The position of the co-tidal lines west of Ushant and Cape Clear indicates that the tide is mainly a derived wave coming to meet the moon and not following her as a true tide produced by an overbalance must do. If it arrives at the same time as a true tide, the highest water that their joint action is capable of will result. If earlier or later, the highest water will be less and at an intermediate time, inclining towards that corresponding to whichever of the two has the greatest elevating power.

The same wave will, an hour or two later, as it raises the level on those parallels, detach offshoots through the North Channel into the Irish Sea and round Scotland and the islands into the North Sea. The latter travelling at a much reduced speed in the shallow water proceeds south to meet another tide coming up the Channel, and is doubtless the cause of the highest tide in the Thames, following at such a long interval full and change of the moon. The faster moving section west

of the Azores will probably feed the tides about the North of Scotland rather than those near Ushant and the English Channel.

The section of the derived wave towards the American coast has a clear run of about 7,800 miles to the 100 fathom line in the deepest water of the Atlantic, where an initial speed of 500 miles an hour would be possible. There are no obstructions in its path, and any check from the passage of the southern depression would be slightly less than on the eastern side, because of the greater distance the wave would have travelled. Still, there would be some reduction from this cause and atmospheric friction. If the wave left the Cape, with the moon on the lower meridian, it would have 17½ hours to reach the coast of Maine under the luminary, entailing an average speed of 445 miles an hour, whilst an hourly speed of 390 miles would bring it there 2½ hours behind her, which is a very moderate amount of retardation to allow for the lunar true tide.

With a view to testing how far Whewell's conclusions applied to the western side of the Atlantic and agreed with modern observations, I extracted from the admirable Tide Tables published by the Canadian Government five spring tides near the summer and winter solstices for the ports of Halifax, on the coast of Nova Scotia, facing the Atlantic, and for St. John, New Brunswick, on the western shore of the Bay of Fundy.

Taking first the port of Halifax, I found that in each case the highest water followed the transit of the moon that agreed with the theory for the ideal world, and at fairly regular intervals the mean of which was 7.7 hours, and is not an excessive retardation. This indicates to my mind conclusively that the dominant factor in producing the tides of Halifax is the forced wave of the true tide following the moon across the Atlantic, though doubtless the derived wave contributes its quota and probably modifies the times as well as the amounts of elevation and depression. Diurnal inequality was irregular, and from ½ to ¾ the greatest difference between springs and neaps, which it was about equal to on the average. It was greater at L.W. springs than at either H.W. or L.W. neaps, indicating an interference that was no doubt due to the derived tide.

Turning now to St. John, each of these solstitial springs followed the transit of the moon required by theory, but at such a long interval as to be generally only half an hour before the transit whose synchronism would reverse the rule. Eleven and a half hours is too much retardation to expect near the coast, and there must be a supplementary cause. Here again it is doubtless the derived wave banked up against and deflected by the coast of Maine, which in this case dominates the situation, quadrupling the rise of Halifax, apparently reversing the law of diurnal inequality, and probably modifying the times of H.W. from those that would obtain if the true tide was alone

responsible for them. The arrival of one wave is not necessarily coincident with that of the other, but any interval will probably be small. Once they join forces, of course they will pursue their course as a single wave. Diurnal inequality is not really reversed, as it is obviously the same wave that was following the moon on the meridian of Halifax, still further retarded by the slope of the sea floor, and perhaps by blending with a slower moving, or later arriving, derived wave.

Whilst diurnal inequality is more regular than at Halifax, it is only about half the greatest difference between springs and neaps, which in some cases it equals. It indicates the interference of the derived wave, inasmuch as it is greater at springs than at neaps and at H.W. than at L.W., whereas I have shown that at solstice it should be greatest theoretically at L.W. neaps on the parallel of 55°; and the same rule holds good only to a lesser degree for the parallel of 45°, which is between these two ports. Diurnal inequality vanishes, as theory indicates it should, at equinox.

The scope of Whewell's examination of Atlantic tides covers a much more extensive field than mine, and his work is doubtless accurate, but he was handicapped by trying to adjust his inferences to dynamical principles, and so failed to deduce what seem to me obvious conclusions from the evidence. He found that diurnal inequality was large and practically universal on the western side of the Atlantic, while on the eastern side it was either non-existent or reversed. He was the first to suggest that the great rise in the Bay of Fundy was due to a derived wave from the Southern Ocean, but as this explanation was ignored and presumably rejected by his successors, Moxly was unaware of it when he arrived independently at the same conclusion. He was the first to see that the tides of the British Islands were connected in some mysterious way with those of the Southern Ocean, but could find no reason for the apparent want of connexion between the tides on the opposite shores of the North Atlantic, which the Tide Tables tell us is inexplicable to this day. To the reader who has followed my argument, I am now in a position to supply a key to this long-outstanding puzzle.

The tides are different because produced by different combinations. Briefly, there are when the moon is away from the equator two unequal tides in the lunar day, the largest being with the moon in the hemisphere she is over, and opposite her in the other hemisphere (the smaller in each case 180° distant along the same parallel). On the western side of the Atlantic, the higher tide of the southern hemisphere combines with the lunar (or higher) tide of the northern hemisphere, and 12 hours later the two smaller tides will come together. Consequently there is a great difference in the heights. On the European side the slower moving wave from the south meets the tide following that which its faster companion conspired with, and so the large

tide from the Cape combines with the smaller northern tide and the small southern wave with the greater northern tide; and thus equality in heights is produced.

To go more into detail, when the moon with high northern declination is 11 hours west of Greenwich the anti-lunar tide has just passed the meridian of the Cape. I have shown that a moderate speed for the depth of water would bring it to the coast of Maine with the moon, or rather with the tide following close behind her. Until it gets near enough to the coast to be affected by retardation, the forced wave along the parallel of 45° will be travelling at the rate of over 700 miles an hour, whereas the free wave, averaging about 400 miles an hour, will probably not have here an hourly speed exceeding 300 miles. As retardation will affect them equally, their relative speeds will be as 3 : 7 till one overtakes the other and they coalesce. Off Halifax the forced wave will not, under these assumed conditions, have yet overtaken the free wave which in any case has here more room to spread out, and so, such a high tide will not result as when the two arrive together on the Maine coast, which will arrest their onward progress and deflect the enormous volume of water into the comparatively contracted Bay of Fundy. The lunar tide will have overtaken the anti-lunar derived tide, and a greater elevation must result than when their two smaller companions meet in the same place 12 hours later, as observation shows to be the case.

The derived wave for North-West Europe starts at the same time and has about the same distance to go to the North of Ireland, and some 300 miles less to the parallel of Ushant. With a similar initial velocity I have shown that the speed must be materially reduced by shallow water and obstructions, and I question whether it would average 300 miles per hour, which would bring it off the entrance to the English Channel in 25 hours, or when the moon is again at her inferior transit, and this, the higher of the two southern waves, would meet the smaller of the true tides of the northern hemisphere. Twelve hours later the smaller tide from the south would arrive with the lunar tide, and thus we get the equality of heights characteristic of these tides. From the nature of the obstructions and the position of the co-tidal lines, I think it probable that the derived tide does not average more than 270 or 280 miles per hour, and that it arrives 2 or 3 hours after the moon crosses the lower meridian. It only requires a mere alteration in detail to show the same results when the moon has high southern declination.

This brief sketch of the nature of Atlantic tides is necessarily incomplete, and more or less speculative from want of data to prove the conclusions that I hope I have at least given plausible reasons for. Nowhere outside the Hydrographic Office can there be sufficient data, or a sufficientt staff to deal with the exhaustive analysis necessary to track the volume, course and speed of the

free wave in the different regions of the North and South Atlantic and estimate the amount of retardation due to the different influences. A fairly close estimate of its ultimate effect on the American coast might, I think, be arrived at by comparing the tides with those of similar parallels in the South Atlantic and Pacific, on the shores of Argentina, Patagonia and New Zealand, where the only interference with the progress of the wave is the retardation caused by the slope of the sea-floor and the land itself. The volume and elevation of the true tide ought to be calculable. Every sea, whatever its size may be, must have a tide of this nature, even though it may be too small to be capable of being observed or measured.

There will be a similar but smaller (because of its latitude and distance from the apex of the cone) derived tide round Cape Horn, which has been principally observed along the west coast of Patagonia and southern part of Chili. Future tidal research may reveal the fact that it has an appreciable effect upon the tides of the islands in the Pacific.

Small derived waves, too, must be generated off the south point of New Zealand and south-west of Australia, but as the land is not continuous to the northward, their effects would be modified and localised by a corresponding but greater elevation from the wave passing north of the island. Wherever the land arrests a portion of the true tide wave, the unobstructed section must raise the level and generate a derived wave, however small or negligible its effect may be.

That these derived waves interfere with the working of our theory in nowise invalidates or even impugns it. When the water surface in one region is artificially raised above that of the other seas in free communication with the elevation, the laws of gravity at once come into operation to restore the level, just as certainly as the water of a river must flow from its source to the sea. Why, in opposition to the case of the river, Nature employs wave motion in the open sea, I am unable to determine, unless it is due to the deeper water, which permits a speed for a free wave one to five hundred times greater than any currents that have been observed in the ocean. The probability of this solution is enhanced by the fact that when friction of the sea-floor has increased beyond a point through diminishing depth, the wave degenerates into a current, whose velocity may be increased as in a river by contracted channels or neighbouring depressions.

The derived wave no more vitiates our theory than the land which produced it, by obstructing the passage of a section of the cone that would have had a free run on the ideal world.

P.S.—Since the above was written I have read in Wheeler's valuable *Practical Manual of Tides and Waves*, that Whewell found "that the tide at any place occurs in the same way as if the ocean imitated the form of equilibrium corresponding to a certain antecedent time . . . . that the equilibrium theory

expresses with very remarkable exactness most of the circumstances on the results obtained . . . . that the tides of Liverpool agree with an equilibrium tide produced in the Southern Ocean 37½ hours before the moon's transit at that port, and transmitted thence unchanged," (this agrees, as far as it goes, with the conclusion I arrived at independently, but I am not clear as to whether he included the effect of the true tide, or attributed all to the derived wave) . . . "and that the changes in lunar parallax and declination are very well represented by the equilibrium theory." When, in addition, we remember that he had to go to it to account for the very existence of diurnal inequality, it seems extraordinary that his eyes were not opened, and a conversion, or reversion, effected. It must have been a blind faith in the infallibility of Laplace that made him still cling to the dynamical theory in the face of this evidence.

NAVAL NOTES.

Home. The following are the principal appointments which have been made:—Rear-Admirals—Sir J. R. Jellicoe, K.C.V.O., C.B., to command of Atlantic Fleet; P. W. Bush, M.V.O., to be Commander-in-Chief, Cape of Good Hope; C. J. Briggs to be a Lord of the Admiralty and Controller of the Navy. Captains—Sir R. K. Arbuthnot, Bart., M.V.O., to *Boadicea*, and as Commodore 2nd Class, in command of First Destroyer Flotilla; A. C. Sykes to *Assistance*; M. F. Sueter to *Hermione* and as Inspecting Captain of Airships; M. Culme-Seymour to *Argyll*.

Rear-Admiral Sir J. R. Jellicoe, K.C.V.O., C.B., has been selected to succeed Vice-Admiral H.S.H. Prince Louis of Battenberg, G.C.B., G.C.V.O., K.C.M.G., etc., A.D.C., in command of the Atlantic Fleet, and is succeeded as Controller and Third Sea Lord by Rear-Admiral C. J. Briggs; Rear-Admiral P. W. Bush, M.V.O., succeeds Vice-Admiral Sir G. Le Clere Egerton, K.C.B., in command at the Cape.

The first-class battleship *Britannia* paid off at Portsmouth on the 28th ult., and recommissioned the following day for a further term of service in the Second Battle Squadron. The first-class armoured cruiser *Inflexible* paid off at Chatham on the 11th ult., and recommissioned the following day for a further term of service in the First Cruiser Squadron.

The Dilke Return of British and Foreign Fleets.—The "Dilke Return" [in continuation of Parliamentary Paper, No. 277], showing the Fleets of Great Britain, France, Russia, Germany, Italy, United States of America and Japan, which want of space has prevented our giving an abstract of earlier, is in the customary form.

The following explanatory note is attached:—

"1. This Return shows all battleships and armoured cruisers of each Navy which have been launched since 31st March, 1889; in the case of other classes all vessels are shown which still retain their armaments, and are not for sale. A fair comparison between the older vessels of each Power may be obtained by reference to their respective ages, displacements, armaments, etc.

"2. Vessels are arranged in classes as follows:—

Battleships.
Coast-defence vessels (armoured).
Cruisers (armoured).
Cruisers (protected), 1st class.
Cruisers (protected), 2nd class.
Cruisers (protected), 3rd class.
Cruisers (unprotected).
Scouts.
Torpedo vessels.
Torpedo boat destroyers.
Torpedo boats.
Submarines.

Home.

"3. Vessels built are shown separately from those building, and vessels are not transferred from the "building" to the "built" section until they have completed their trials and are ready for commissioning.

"4. In each class, vessels are arranged in types, the latest designed type being placed first in the case of those built, and last in the case of those building.

"5. A nominal table prefaces each class.

"6. In the column headed "horse-power," the figures are to be taken as representing maximum I.H.P. (= indicated horse-power) except where they are followed by the letter T, which indicates that turbine machinery is fitted."

The following is a summary of the different classes of ships:—

Battleships.—Great Britain, 53 built, 6 building; France, 18 built (including 1 condemned), 6 building; Russia, 7 built, 5 building; Germany 32 built, 10 building; Italy, 10 built, 1 building; United States, 26 built, 6 building; Japan, 14 built, 4 building.

Coast-defence Vessels.—Great Britain, *nil;* France, 10; Russia, 2; Germany, 11; Italy, *nil;* United States, 11; Japan, *nil.* None building.

Armoured Cruisers.—Great Britain, 38 built, 1 building; France, 20 built, 2 building; Russia, 4 built, 2 building; Germany, 8 built, 4 building; Italy, 7 built, 3 building; United States, 15 built; Japan, 11 built, 2 building.

Protected Cruisers (First-class).—Great Britain, 18; France, 5; Russia, 7; Germany and Italy, *nil;* United States, 3; Japan, 2. None building. Second-class.—Great Britain, 38 built, 5 building; France, 12 built; Russia, 2 built; Germany, 21 built, 7 building; Italy, 4 built; United States, 16 built; Japan, 10 built, 1 building. Third-class.—Great Britain, 16; France, 11 (including 1 condemned); Russia, 2; Germany, 12; Italy, 12; United States, 2; Japan, 8. None building.

Unprotected Cruisers.—Great Britain, 2 building; France, *nil;* Russia, 2 built; Germany, 11 built; Italy, *nil;* United States, 10 built; Japan, 7 built.

Scouts.—Great Britain, 8 built; United States, 3 built; other Navies, *nil.*

Torpedo Vessels.—Great Britain, 18, depôt ships for destroyers 3, depôt ships for submarines 2; France, 12 (including 1 to be condemned), and 1 special service vessel; Russia, 6; Germany, 1; Italy, 5; United States, 2; Japan, 1, and 1 depôt ship for submarines. None building.

Destroyers.—Great Britain, 146 built, 25 building; France, 56 built, 16 building; Russia, 97 built, *nil* building; Germany, 73 built, 13 building; Italy, 17 built, *nil* building; United States, 20 built, 15 building; Japan, 55 built, 3 building.

Torpedo Boats (Formerly Coastal Destroyers).—Great Britain, 30 built, 6 building. General List.—Great Britain, 80; France, 262; Russia, 84; Germany, 83; Italy, 109; United States, 30; Japan, 69. Building *nil.*

Submarines.—Great Britain, 45 built, 23 building; France, 49 built, 49 building (of which 24 are not yet actually commenced); Russia, 24 built, 11 building; Germany, 4 built, 4 building; Italy, 7 built; United States, 12 built, 16 building; Japan, 8 built, 2 building.

France. The following are the principal promotions and appointments which have been made:—Rear-Admiral—E. Lecourtois to Cherbourg, as Major-General. Capitaines de Vaisseau—F. Lecourtois to Rear-Admiral; A. M. Ytier to *Démocratie;* R. M. Morin de la Rivière to *Dupleix;* P. P. Thibault to *Jeanne d'Arc.* Capitaines de Frégate—E. L. Rey for service at Lorient; R. M. Provensal to *Bruix;* M. H. Vesco to *Chasseur* and command of a division of destroyers of the 1st Squadron.—*Journal Officiel de la République Française.*

The Naval Manœuvres (continued). 2nd Theme.—The theme of the second phase of the manœuvres was as follows:—

A squadron (*Blue*), temporarily mistress of the western basin of the Mediterranean, was concentrated at Algiers with the duty of securing the safe passage of two important convoys from Algeria to the coast of France. The convoys consisted of a certain number of transports respectively concentrated at Algiers and Oran.

On the 27th May, at four in the morning, when the loading of the transports and the embarkation of the troops were not yet completed, the commander of the squadron (Vice-Admiral de Jonquières) received information at the same moment:—

1. That at the previous midday, a squadron (*Red*), slightly inferior in force, and comprising some battleships, armoured cruisers and destroyers, had been observed in the Otranto Channel, in latitude 40 N., and longitude 16—30 E., steaming at a speed of about 12 knots, and steering for the western basin of the Mediterranean.

2. That other important *Red* forces had been met in the Atlantic, which there was reason to anticipate would, in less than three days, enter the Mediterranean.

In spite of this information as to the menacing movements of the enemy's forces, the commander of the *Blue* squadron was under the obligation of getting to sea with his convoys in 48 hours at the outside. On the other hand, in order to complete the loading of his convoys, a minimum delay of 20 hours was necessary before starting. The task which lay before him was to escort before Tuesday morning the 31st May, that is in less than four days, the two convoys which were under his charge, each into a different fortified port on the French coast (in accordance with the plans for disembarkation), these ports being either Port Vendres, Marseilles, or Toulon.

The *Blue* force was represented by the First Battle Squadron in its full strength (for details of the two fleets, see Naval Notes (France) in October No.), with the torpedo flotillas of France and Algeria, the coasts of which were considered *Blue* territory. The convoy from Algiers by the armoured cruiser *Dupetit-Thouars* (detached from the Second Squadron), and the convoy from Oran by the *Foudre.*

The objective of the *Red* force, which was represented by the Second Squadron (under the command of Vice-Admiral Aubert), coming from the Adriatic, was the capture of the convoys while *en route* to their

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destination. The coast of Corsica and the Corsican torpedo-flotilla were considered *Red*.

The following regulations were laid down:—

The operations were to commence at 4 a.m. on the morning of Friday, the 27th (May). The *Blue* battleships and heavy cruisers could not move before midday, as 7 to 8 hours was the time supposed to be necessary for getting clear of the port. The convoys, however, had to wait 20 hours before they could quit their ports, in order to complete their loading, and therefore could not leave their respective ports before midnight of the same day. Their maximum speed was fixed at 10 knots, and they were supposed to have an escort of light vessels capable of driving off torpedo boats during the day. They were forbidden to make use of neutral ports. Every convoy captured or driven to take shelter in neutral ports was neutralised, and had to proceed to the rendezvous.

The *Red* Squadron, which was reported to be coming from the Tyrrhenean Sea, was, as a matter of fact, lying at the anchorage of Porto Vecchio (on the S.E. Coast of Corsica), which it could not leave, the cruisers until 2 a.m. of the 28th, and the battleships until noon of the same day. The speed of the battleships was not to exceed 12 knots, and that of the cruisers and torpedo vessels 15 knots.

All the ships which had not previously joined the flag of the Director of the Manœuvres, or which should have taken no part in the concluding fight of the exercise, were to concentrate not later than the 31st May, the *Blue* at Ajaccio, and the *Red* at Toulon, in readiness for carrying out the 3rd Theme.

The Execution of the Theme.—At 4 a.m. on the 27th, Vice-Admiral de Jonquières despatched a group of his destroyers to cruise to the South of Sardinia, and a second group off the Straits of Bonifacio, to give information of any signs of the enemy; at the same time the Toulon flotilla, consisting of sea-going torpedo boats (not destroyers) received orders to watch to the North of Corsica; these small vessels were afterwards to join the two first groups between Cape St. Sebastien and the Balearic Islands, the flotilla off Port Vendres.

The flotillas of Algiers and Oran, concentrated in the first-named port, proceeded to sea at the same time, the one to the North, the other to the South of Minorca, in order to watch the approaches; the remaining disposable destroyers of the First Flotilla received orders to escort the convoys from Algiers and Oran, which were to meet to the south-west of the Island of Ivica.

The light division of the *Blue* armoured cruisers also received orders to weigh, and after having scouted to the eastward of Algiers, to return and head the two convoys, which would then have joined each other, in order to cover them as they shaped their course towards the N.E. The Commander-in-Chief, with his *Blue* battleships, proceeded himself at full speed towards the Straits of Bonifacio, in order to take up a good position, either to meet the *Red* squadron, if it was reported passing to the North of Corsica, or,

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instead, coming round the South of Sardinia, or to drive it back, should it attempt to break through the Straits in order to harass the convoys by the most direct route to the North of the Balearic Islands.

As the result of these dispositions, at noon of Saturday the 28th, the position of the *Blue* forces was as follows:—

The Oran convoy, steering to pass to the West of Ivica; the convoy from Algiers, escorted by destroyers, steering so as a couple of hours later to join the one from Oran, both then shaping course together for Port Vendres. The *Blue* cruisers, which had been covering them at a distance, would in two hours' time intersect their course and then take station ahead of them, while the *Blue* battleships were off the Straits of Bonifacio ready to drive the *Red* back should they attempt to come through that Channel. The destroyers and torpedo boats were at the stations assigned to them to look out for the enemy.

In the meantime, the Commander-in-Chief of the *Red* force (Vice-Admiral Aubert) was, as we have said, anchored off Porto Vecchio, and at 2 a.m. on the morning of the 28th, he despatched his cruisers to sea, ordering them to proceed through the Straits of Bonifacio (Porto Vecchio is only a bare 20 miles from the Straits), and steer a course to the N.W. of Majorca, in order, as soon as possible, to take up a position from which they could intercept the convoys, as they came up to the westward of the Balearic Islands. At the same time he directed the Ajaccio flotilla to keep watch off the Straits, in the direction of Algiers, in order to notify the approach of the *Blue* squadron, which he expected would arrive from this direction. It was not long before the *Arbalète* signalled that the enemy's battleships were in sight, and not being strong enough in the absence of his cruisers to himself force a passage through the Straits, Vice-Admiral Aubert, weighing at noon of the 28th, decided to pass to the North of Corsica. By that time the *Red* cruisers were half-way between the Straits and Minorca, steering so as to bar the way between Dragonera (off the West Coast of Majorca) and the Columbretes Islands.

In order to make sure that the *Red* battleships should not pass through the Straits, Vice-Admiral de Jonquières remained with his squadron off the entrance to them until Saturday evening, when he shaped course to the west in order to be in a position to take a more direct part, if necessary, in the defence of the convoys, which were proceeding along the prescribed route, headed by the *Blue* cruisers, which were in sufficient strength to drive back the *Red* ones in case of meeting them, whilst the destroyers with the convoy could protect them against an attack by the hostile torpedo boats.

Admiral de Jonquières did not, however, disguise from himself that the two convoys thus united might suffer some loss in case of a meeting with the *Red* cruisers, so he decided on the Saturday night to order the *Blue* cruisers to leave the Oran convoy to steer for Port-Vendres under the protection of the destroyers, and—whilst covering the convoy from Algiers—to effect a junction with the battle squadron to the North of Minorca.

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This concentration of the *Blue* forces was a necessary step, because although he had no information as to the movements of the *Red* force, Admiral de Jonquières rightly concluded that it was to the interest of the enemy to concentrate his forces off Port-Vendres, Marseilles and Toulon, which were sufficiently near to each other to allow of searching for the convoys in their immediate neighbourhoods. Receiving the order to part company from the convoys, the *Blue* cruisers effected their junction with the main body of the *Blue* fleet at midday on the 29th May. At this date the convoy from Algiers was well covered by the whole *Blue* force, and from that time steered a course straight for Toulon, the Oran convoy continuing towards Port-Vendres, from which it was not more than 12 hours distant, keeping as close as possible to the Spanish coast. The *Blue* destroyers, which had rejoined the flag to the North of the Balearics, after having completed their watch to the North and South of Sardinia, received orders to cruise off Port-Vendres, so as to ensure the safe entry of the Oran convoy.

In the meantime, Admiral Aubert, with the *Red* battleships, passing to the North of Corsica, shaped a course which would place him at a point equally distant from Port-Vendres, Marseilles and Toulon, and here he arrived at noon of the 29th. At this moment, not having received from his cruisers any report of their having fallen in with the convoys, he considered it necessary to concentrate his forces, so he recalled his cruisers, as well as the destroyers, which he had ordered to bar the way to the enemy's ports. This concentration being effected on the morning of the 30th, he proceeded to manœuvre with the object of methodically searching for the convoys and engaging the *Blue* forces, which he hoped to be able to disperse with the aid of his torpedo flotilla.

At the moment when the *Red* force was thus menacing the convoys, the one from Oran had already arrived at Port-Vendres, while the one from Algiers, covered on the west by the coast, was steering for Toulon, keeping as much as possible to the east, since Admiral de Jonquières still considered that the *Red* force, if concentrated, might be able to seriously impede the passage of the transports, in spite of the presence of his whole force. However, owing to the *Red* cruisers being kept too closely to their main body, they were unable to scout as far as the approaches to Toulon, and on the 30th May at midday, the Algiers convoy arrived safely at that port.

The weather was not favourable during the latter part of the time, and the small vessels having to face a strong *mistral* in the Gulf of Lyons, found their duty extremely trying.

The want of small cruisers with the fleet was particularly felt on both sides, as it was impossible to scout efficiently for the enemy. Thus the commander of the *Red* force, under penalty of being overwhelmed, had to recall his armoured cruisers to the line of battle, as soon as a meeting with the *Red* force appeared imminent, and he was thus deprived of any chance of dispersing one of the convoys, should they have separated, or of learning their position sufficiently early to take steps to intercept one of them. The practice of employing destroyers to

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do the duty of light cruisers has been the subject of much criticism, as they are not intended for such work, and their coal stowage is so small that they soon run out and are exposed to the danger of thus being rendered helpless at the moment when they may have to engage the enemy.—*Précis* from *La Vie Maritime.*

(*To be continued.*)

Germany. The following are the principal promotions and appointments which have been made:—Vice-Admirals—Paschen to be Admiral; Schröder to be Commander-in-Chief of the Baltic Station; Truppel to be Governor and Commander-in-Chief of the Kiautchau Protectorate. Rear-Admiral—Dick to be Director of the Dockyard Department at the Ministry of Marine. Kapitäns zur See—Von Holleben to be Superintendent of the Dockyard at Danzig; Behncke to *Westphalen*; Von Kühl Wetter to *Hessen*; Schmidt von Schwind to be Director of the Naval Academy; Scheidt to *Blücher*; Boedicker to *Schleswig-Holstein*. —*Marineverordnungsblatt.*

On the 15th September, Vice-Admiral von Ingenohl took over the command of the II. Squadron of the High Sea Fleet from Vice-Admiral Schröder, hoisting his flag on board the first-class battleship *Preussen*; Vice-Admiral Schröder has since been appointed Commander-in-Chief of the Baltic Station, his Headquarters being at Kiel. Rear-Admiral Bachmann also took over the command of the Scouting Division on the 15th September from Vice-Admiral von Heeringen, hoisting his flag on board the first-class armoured cruiser *Roon.*

The two new first-class battleships *Posen* and *Rheinland*, of the *Dreadnought* type, having successfully completed their trials (the *Rheinland* making a mean speed of 20·01 knots and the *Posen* 20·51 knots, on their full-speed trials, as against the 20 and 20·3 knots of the *Nassau* and *Westphalen*), were commissioned for service in the I. Squadron of the High Sea Fleet on the 20th September, taking the place of two older battleships, the *Wittelsbach* and *Jähringen*, which have been paid off. There are now four battleships of the *Dreadnought* type in commission in the I. Squadron, the two others being the *Nassau* and *Westphalen.*

The length of time taken in the construction of the first four *Dreadnoughts* has been: *Nassau*, 40 months; *Westphalen*, 36 months and a half; *Rheinland*, 37 months; and *Posen*, 39 months.—*Marine Rundschau.*

The Personnel of the Fleet: The Officers' Corps.—The following are the numbers of the officers of different ranks on the Active List of the Fleet:—4 admirals, 8 vice-admirals, 19 rear-admirals, 84 captains, 199 frigate or corvette-captains, 461 captain-lieutenants, 1,055 lieutenants, 398 midshipmen, and 185 Naval Cadets. There is thus an increase in the present year of 2 rear-admirals, 4 captains, 10 frigate or corvette-

Germany.

captains, 27 captain-lieutenants, 52 lieutenants, with a decrease of 30 midshipmen, and no change in the number of Naval Cadets. There are, further, 2 retired rear-admirals, 14 retired captains, 19 retired frigate and corvette captains, and 6 retired lieutenants employed on special duties, while 53 captain-lieutenants and 97 lieutenants are employed in ordnance and torpedo duties at the various dockyards and coast stations.

According to the Appendices to the Estimates for 1906 and 1908, there are to be in 1920:	Number.	Percentage.	Estimates for 1910, on the basis of a similar percentage as for 1920.	Numbers according to Estimates for 1909.	Number to be demanded for 1911.
Admirals and Vice-Admirals	18	0·7	12	12	—
Rear-Admirals	25	1·0	19	17	2
Kapitäns zur See	122	4·6	84	80	4
Fregatten- or Korvettenkapitäns ...	289	10·9	199	189	10
Kapitänleutnants	667	25·2	461	434	27
Senior Lieutenants	922	34·8	1055	1003	52
Lieutenants	605	22·8			
Total	2648	100·0	1830	1735	95

The Staff of the Marine Battalions is as follows:—

1 Colonel (Inspector of Marine Infantry, with the rank of Regimental Commander), 2 Battalion Commanders, 11 Captains, and 36 First and Second Lieutenants.

The Marine Field Artillery have 2 Captains, 2 First-Lieutenants, and 4 Lieutenants, and the Pioneer detachment, 1 Major, 2 Captains, and 1 First-Lieutenant.

The Engineering Department consists of 12 Chief Engineers and Senior Staff Engineers, 75 Staff Engineers, 119 Senior Engineers and 192 Engineers, being an increase of 35 over the numbers of last year.

The Medical Department consists of 1 Medical Director-General (with rank as Rear-Admiral), 4 Inspector-Generals (with rank as Captain), 64 Senior Staff-Surgeons, 91 Staff-Surgeons and 113 Surgeons and Assistant-Surgeons, being an increase of 15 over the numbers of last year.

In the Accountant Department are 43 Staff Paymasters and 173 Senior Paymasters and Paymasters, an increase of 9 over last year.

Seamen, Stokers, etc.—The Seamen's, Boys, Dockyard, and Torpedo Divisions number as follows:—

664 Chief Warrant Officers;
1,249 Warrant Officers;
8 Bandmasters;
216 Chief Petty Officers;
3,815 First-class Petty Officers;
5,723 Second-class Petty Officers;
8,364 Leading Seamen;

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25,092 Seamen and Stokers;
96 Boys' Petty Officers;
1,554 Boys.

These are distributed among the different Divisions in accordance with the following table:—

	Chief Warrant Officers.	Warrant Officers.	Bandmasters.	Chief Petty Officers.	1st Class Petty Officers.	2nd Class Petty Officers.	Leading Seamen.	Seamen.	Petty Officers for Boys.	Boys.	Total.
Seamen's Divisions..	158	236	8	118	1,436	1 931	4,139	12,417	—	—	20,443
Boys' Division ...	—	—	—	—	—	—	—	—	96	1,554	1,650
Dockyard Divisions:											
Engine - room Personnel	344	690	—	—	1.413	2,120	2,148	6,447	—	—	13,162
Other Ratings ...	40	81	—	2	385	577	431	1,292	—	—	2,868
Torpedo Divisions:											
Seaman Personnel ...	25	49	—	36	206	309	700	2,099	—	—	3,424
Engine - room Personnel	97	193	—	—	465	696	946	2,837	—	—	5,234
Total 1910 ...	664	1,249	8	216	3,815	5,723	8.364	25,092	96	1,554	46,781
In 1909	629	1,182	—	207	3,583	5,374	7,810	23,428	96	1,554	43,871
Increase 1910 ...	35	67	8	9	232	349	554	1,664	–	—	2,910

There is an increase over last year of:—35 Chief Warrant Officers; 67 Warrant Officers; 9 Chief Petty Officers; 232 First-class Petty Officers; 349 Second-Class Petty Officers; 554 Leading Seamen; 1,664 Seamen, etc., showing a total increase of 2,910.

The Seamen Artillery Divisions and Mining Detachment numbers 30 Chief Warrant Officers, 61 Warrant Officers, 3 Bandmasters, and 3,892 Petty Officers and men, of whom 15 Chief Warrant Officers, 30 Warrant Officers, and 800 Petty Officers and men belong to the Mining Detachment. There is an increase of 3 Chief Warrant Officers, 7 Warrant Officers, and 283 Petty Officers and men over last year, of which increase, 2 Chief Warrant Officers, 5 Warrant Officers, and 72 Petty Officers and men are added to the Mining Detachment.

The Marine Infantry numbers 2 Bandmasters, 197 non-commissioned officers, and 982 men, being a decrease of 13 non-commissioned officers and 171 men, as compared with last year.

The Sick Bay Staff consists of 574 Petty Officers and men of various grades, being an increase of 34 over last year, and there are 380 ships' stewards, writers and assistants, an increase of 17.

The sum total of all ranks is 57,170, being an increase of 3,431 over the numbers for last year.

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Personnel.	Officers.	Doctors.	Non-commissioned Officers and Seamen.				Total all Ranks, 1910.	Increase compared with 1909.
			Warrant Officers.	Pay Officers.	Seamen.	Boys.		
Naval Officers	1,872	—	—	—	—	—	1,872	94
Junior Executive Officers...	—	—	—	398	185	—	583	—
Engineer Officers	401	—	—	—	—	—	401	35
Seamen, Boys, Dockyard and Torpedo Divisions...	—	—	1,913	9,762	33,456	1,650	46,781	2,910
Seamen Artillery	—	—	91	549	3,346	—	3,986	293
Marine Infantry	50	—	—	210	1,153	—	1,413	2
Personnel of the Clothing Department ..	2	—	—	27	150	—	179	2
Medical Department ...	—	273	—	244	330	—	847	47
Artillery Administration ...	93	—	127	68	—	—	288	14
Torpedo *Personnel* (Technical and Administrative)	61	—	145	59	—	—	265	15
Mining *Personnel* (Technical and Administrative)	30	—	46	71	—	—	147	6
Accountant Department ...	—	—	91	230	59	—	380	17
Surveying „ ...	—	—	28	—	—	—	28	—
Total	2,509	273	2,441	11,618	38,679	1,650	57,170	3,431
	2,782		54,388					

—*Etat für die verwaltung der Kaiserlichen Marine auf das Rechnungsjahr*, 1910.

United States.

The Lake Washington Canal.—A public work of much importance, though not widely known, is the proposed canal connecting the tidal waters of Puget Sound with the fresh water lakes, Union and Washington, lying in or adjacent to the city of Seattle, Wash. The project is a very old one, though it has yet progressed no further than the acquirement of right-of-way, the formal adoption of a project by the War Department and its submission to Congress, and certain local measures now in progress for the raising of funds to aid the government in the work.

The canal is to be a joint enterprise, to the cost of which the government and the local community will ultimately contribute about equal shares. The local community has already acquired and delivered to the United States the right-of-way, costing about 250,000 dollars. It will excavate the channel at a cost of about 1,000,000 dollars. The railroads, street car companies and city will have to construct bridges and other crossings at their own expense, so that the entire local outlay will probably foot up about 2,500,000 dollars. The government will build the lock and controlling works and a power plant. It will also build the entrance works and take care of certain other features of the project and will maintain and operate free of toll the completed work. The cost to the government will be about 2,500,000 dollars.

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Following are some of the benefits of this work which justify its construction and which also justify a division of the burden between the government and the local community.

It will be of great value to the navy by giving an admirable fresh water waiting basin for vessels laid up in ordinary time of peace. Puget Sound will always be an important naval rendezvous, and the Navy Yard is only 18 miles from the canal entrance.

It will give a much-needed expansion to the harbour facilities of Elliot Bay. The practically available frontage on the Bay does not exceed 5 miles, and a large part of this is in the hands of the railroads. The opening of the lakes will give fully ten times greater frontage than at present, and much of it better situated for public convenience. It will make accessible extensive sites suitable for manufacturing establishments. The areas at present available, where both rail and shipping facilities can be had, are extremely limited.

The completion of the canal will give much-needed anchorage grounds for shipping. Many vessels are laid up during the winter, and owing to the excessive depth of water in Puget Sound, suitable anchorages are very scarce. Not only will the lakes afford better anchorage grounds, but they are free from the destructive effects of marine life which is very active in the waters of the Sound. The hulls of vessels will suffer much less deterioration than in salt water. Likewise subaqueous timber construction, which cannot be depended upon for more than a year in the Sound, unless the timber is "treated," is practically imperishable in fresh water. The shallower depths also will be much less expensive for wharf construction and maintenance.

The lakes are, of course, entirely free from tidal fluctuation, which on the Sound has a mean range of 10 feet and an extreme range of 18 feet. The fixed level will be a great gain in all shipping operations.

The foregoing advantages are of a general character, but there are others of a purely local character that are very important.

The cost of drayage in Seattle is large because of the extremely uneven topography of the city and the absence of good grades leading up from the present water front. The canal will flank the hills, distribute freight throughout the city and reduce the cost of drayage, it is estimated, by 25 to 50 cents a ton. This saving will in a few years equal the local contribution to the cost of the canal.

The lowering of Lake Washington to the level of Lake Union will drain all swamp areas around the shores of the lake, relieve the valley of Black and Duwamish rivers of the floods of Cedar River by turning the latter stream directly into the lake, and will make the whole run-off from the Lake Washington and Cedar River watersheds (580 square miles) available for power at the lock site. Drainage, flood protection, and accessibility to shipping will greatly enhance land values around the Lakes. Lake Union will become virtually a great dock in the very heart of the city.

The removal of the natural barrier between the two lakes and the establishment of a connection with the Sound will greatly enlarge the field of pleasure boating which already plays a large part in the life of the local community. Some fear is felt that the proposed changes will detract from the natural beauty of Lake Washington, but a careful analysis of the

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question shows that the effect will be imperceptible after a period of two or three years, and will result in improvement, so far as there will be any noticeable change.

The right-of-way for the canal is 300 feet wide. There will be a single lock with a large and small chamber. The large lock or chamber will be about 800 feet long by 80 feet wide and 36 feet deep and will take any vessel likely to visit Puget Sound for many years to come. The little lock will be 150 feet long by 30 feet wide and 16 feet deep, and will be used by small craft of all descriptions, the number of which is very large and rapidly increasing. Probably 90 per cent. of transfers of vessels will be through this lock.

The entire structure will rest on an excellent foundation of very hard, tenacious blue clay of great depth. It will be built of reinforced concrete and steel, and will embody the best features of modern lock construction. The controlling works at the lock will consist of a power house by which the entire flow through the canal will be turned to use. The great reservoir formed by the lake gives complete control of the run-off and distributes the flow quite evenly throughout the year. The revenue from this power will return about 14 per cent. on the cost of the plant and will nearly pay for the future operation and maintenance of the canal. The problem of maintenance will be greatly simplified by the entire absence of sediment in the water and consequently of deposits in the canal and the necessity for dredging. The physical problems involved in the building of the canal are of the simplest character.

This canal has been the dream of Seattle ever since it began its existence, but the rapid growth of the city and the great variety of interests affected create opposition here and there which has succeeded in delaying the work much longer than should have been the case. It is now expected that the project will be completed within the next three or four years.—*Scientific American.*

MILITARY NOTES.

THE KING.

The King has been graciously pleased to approve of the "18th (Victoria Mary, Princess of Wales's Own) Hussars," being in future designated "18th (Queen Mary's Own) Hussars."

Indian Army.—The King has been graciously pleased to confer upon the undermentioned Regiments the honour of becoming their Colonel-in-Chief:—

6th King Edward's Own Cavalry.
102nd King Edward's Own Grenadiers.
2nd King Edward's Own Gurkha Rifles (The Sirmoor Rifles).

Home. The following are the principal appointments which have been made:—

Major-Generals—C. L. Woollcombe, C.B., to be Colonel The King's Own Scottish Borderers; Charles A. Anderson, C.B., to command the troops in South China. Colonels—R. H. Davies, C.B., New Zealand Militia, to command 6th Infantry Brigade (Aldershot Command), with temporary rank as Brigadier-General; Arthur E. Sandbach, C.B., D.S.O., to be Chief Engineer, Irish Command; Stanley B. Von Donop to be an Assistant-Director at the War Office; William H. Rycroft, C.B., to be Assistant-Adjutant and Quartermaster-General, Cape of Good Hope District; George T. Forestier-Walker to be Assistant-Quartermaster-General Southern Command.

Territorial Force.—Major-General—The Hon. Julian H. G. Byng, C.B., M.V.O., to command of East Anglian Division. Colonels—Frederick A. Adam to command of North Lancashire Brigade (West Lancashire Division); John J. F. Hume to command of Welsh Border Brigade (Western Command); C. M. Brunker, D.S.O., to command of Lancashire Fusiliers Brigade (East Lancashire Division).

Austria-Hungary. *The School of War.*—In 1907 a reorganisation of the School of War was carried out by General Conrad von Hölzendorf, the new Chief of the General Staff, among other steps taken being the reduction by half of the number of officers admitted annually to follow the courses, the number of entries being proportioned solely to meet the requirements of the staff service.

The first class of these officers, entered at the School since this modification, have recently completed their third year of studies. Out of 55 officers, who have followed the courses, 44, that is 80 per cent., have satisfactorily passed their final examinations; of these, 18 belonged to the infantry of the line or Chasseurs, 10 to the cavalry, 3 to the artillery, 2 to the technical troops, 4 to the Austrian *Landwehr*, and 7 to the *Honved*. 25 among them joined the army from a Military Academy, 16 from a Cadet School, and 3 from the One-Year Volunteers.

Reorganisation of the Technical Military Academy.—By an Order of the 10th August, the engineer section of the Military Technical Academy is divided into two classes, that of the Pioneers and the other of the troops of communication.

In addition, to start from the scholastic year, 1912-13, no pupil of the Pioneer Cadet School will be attached to the sapper railway and telegraph regiment, whose officers will be recruited for the future solely from the pupils of the Military Technical Academy (Class of the Troops of Communication). These new dispositions are the consequence of the creation at the end of last year of the brigade of troops of communication, which is composed of the regiment of railway sappers and of the telegraphists, the balloon establishments, and the automobile cadres.

The brigade, whose headquarters are at Vienna, is attached for disciplinary purposes to the IInd Army Corps, but otherwise receives its orders direct from the Ministry of War; the balloon establishment,

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however, still remains attached for administrative purposes to the 1st Regiment of Fortress Artillery.—*Revue Militaire des Armées Etrangères.*

New Organisation of the Train.—Up to the present the Train has been comprised of three regiments, each composed of 4 to 5 Train divisions, numbered from 1 to 14, and of an independent 15th Division (Bosnia-Herzegovina). Each of the fourteen first divisions consisted of a variable number of Train squadrons (in all 93), a cadre of a depôt squadron, and an escort squadron. The 15th Division had a special organisation, which included a certain number of squadrons of Mountain Train. An Order of the 28th June last makes certain modifications in this organisation.

Under the new organisation the regiment will no longer exist as a unit, and six field officers (Colonels or Lieut.-Colonels) become Inspectors of the Train at Vienna, Budapest, Lemberg, Agram, Insprück, and Sarajevo. The divisions will be numbered from 1 to 16 (1 per Army Corps). The 15th Division is divided into two, forming the 15th and 16th Divisions. Each division will consist of 1 staff and a certain number of Train squadrons or Mountain Train squadrons; a cadre of the Train Park (this latter in order to facilitate its mobilisation), and a Depôt Cadre.

The divisions 1 to 14 have each an escort squadron for the field provision and forage magazines, while Nos. 12 and 14 have in addition 1 squadron cadre of Mountain Train. The escort squadrons, as well as the squadron cadres of Mountain Train and the Park and Depôt Cadres bear the same number as the Train division, of which they form part.

The recapitulation of the divisions, squadrons, and different cadres gives the numbers as follows:—

Old Organisation	*New Organisation.*
15 Divisions;	16 Divisions;
91 Squadrons;	89 Squadrons;
10 Mountain Squadrons;	20 Mountain Squadrons;
2 Squadron Cadres of Mountain Train;	2 Squadron Cadres of Mountain Train;
15 Depôt Cadres;	14 Escort Squadrons;
	16 Park Cadres;
	16 Depôt Cadres.

The total effective of the Train, on a peace footing, is 500 officers and officials, 9 probationary sub-lieutenants, 5,164 men, and 3,945 horses.

The armament of the *personnel* is as follows:—For officers, non-commissioned officers, assistant accountants and trumpeters, the cavalry sabre and revolver; for the soldiers, the pioneer sabre and repeating carbine.

The Train troops are placed under the authority of a Train Inspector-General, who inspects the service as regards the training of the *personnel*, and the state and condition of the *matériel*. It constitutes an auxiliary department of the Ministry of War.—*Bulletin de la Presse et de la Bibliographie Militaires.*

Competitions for Determining the Best Shooting Units.—*Précis* of an article in the *Militärische Presse*, 8th June, 1910.—

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—Wide differences of opinion are held regarding the nature of the above competitions and also regarding the best manner of executing them. Whereas in some units practically every man, irrespective of his performance in individual practices, takes part in the so-called "Marksman's Competition," in others commanding officers only allow selected men to join in these exercises. In the first case about 5 rounds only are available for each man, and in the latter between 15 and 20 as a rule.

Moreover, opinions differ as to the prizes to be awarded for skill shown, and also as to the advisability of carrying out such practices at all. Some commanding officers, for instance, do not allot all the prize money allowed by regulation for these practices, while others devote to it in addition grants intended for other exercises.

There is no doubt that rifle competitions are the best means of improving shooting. The question, however, is, what do we mean by the best marksmanship of a regiment? It does not mean the best aggregate results obtained by all the men, good and bad, of a regiment, for this would mean that men who have proved themselves to be first-rate shots and have laboured throughout the year to bring their marksmanship to the highest possible point, would often be classed as inferior to worse shots of another unit. This is wrong, both from a moral and an instructional point of view, and should never occur. The remedy is to let 20 to 25 per cent. of the different classes of shots in each unit take part in inter-regimental competitions, competitions being arranged for each class. By this means the keenness of all classes of shots will be stimulated.

Again, in order to reward the best marksmanship, the men should receive prizes who carry out a certain number of selected exercises in the most approved manner. If only one exercise had to be carried out, if the military rifle were a weapon of absolute precision, and if all the competitors fired under precisely similar conditions, the method of selection would be simple. The hits on the targets need only be compared and the results announced.

The military rifle is, however, far inferior to many match rifles, and errors due to its inaccuracy and to faulty ammunition are of importance when fire is directed on a small target. It follows, therefore, that having regard to the range the target should be of such a size that the errors of the rifle are of little importance. Figure targets are the most suitable and at least 10 rounds per man should be allowed.

The question of sighting shots remains to be considered. In order to exclude the element of luck as much as possible, it appears advisable to allow one or two sighting shots at each distance. This teaches each man to take note of the effect of atmospheric conditions, and tends to increase his reliance on his own judgment. As regards distances, bad shots should not be required to compete at longer ranges than 300 yards, the next category at 400 yards, and so on.

To sum up, in musketry training the most important point is thoroughly to impress on the beginner that in rifle shooting there is no such thing as chance, and all exercises and competitions should be designed to impress this on the man's mind.

France. *The Army Estimates for* 1910:—

The General Budget for 1910 amounts to:—

Expenditure	£167,415,299
Receipts	£167,423,350

The sums allotted to the War Budget are distributed as follows:—

1st Section—Home Troops	£29,764,506
2nd Section—Colonial Troops	£1,576,807
3rd Section—Constructions and New *Matériels*, Mobilisation Supplies and Stores	£3,544,706
Total	£34,886,020
With the Naval Estimates	£15,023,019
Total Expenses for National Defence	£49,909,039

The service of the Public Debt, which includes among other expenditure £6,821,800 for military and naval pensions, amounts to £50,774,688.

In addition to the credits given above in the 2nd Section, and which relate to the Colonial troops stationed in France, the Budget for the Colonies includes a sum of £3,360,000 allotted to the cost of the military forces stationed abroad, with the exception of those of Algeria and Tunis, the expenses of which are included in the 1st Section.

The War Budget for 1910 shows an increase of £2,920,000 over that of 1909. Among the principal causes of this increase comes the reorganisation of the field artillery, decreed last year, and the strengthening of which accounts for about £1,400,000 in this year's Estimates. The manufacture of machine guns, the construction of new mountain guns, and other *matériel* absorbs another sum of £260,000. Moreover, the application of the Law of 21st March, 1905, which established two years' service, has added to the Army Estimates successively £400,000 in 1906, £480,000 in 1907, £300,000 in 1908, £320,000 in 1909, and £280,000 in 1910. The permanent total increase, which is the result of the introduction of the two-years' service, reaches to-day the sum of £1,780,000, which does not include the £160,000 for carrying the new system into effect, which is found in the Budgets of 1907, 1908, and 1909, and the £200,000 which figures in that of this year.

The rise in the cost of provisions and forage, in the pay of officers, with the reconstruction of barracks and of some of the hospitals, &c., accounts for the remainder of the increase above-mentioned of £2,920,000. It must be remarked that the supplementary credits appearing in the current Estimates are added every year to the credits voted first by Parliament. These supplementary credits amounted to about £2,560,000 in 1908, and to £2,040,000 in 1909.

The Effective Strength.

According to the statement in the Budget by the Minister of War, the effective strength of the army amounted to 29,209 officers and civilians

France.

with relative military rank, 577,094 non-commissioned officers and men, and 141,436 horses, divided as follows :—

	Officers and civilians with Army rank.	Under-officers	Corporals etc.	Soldiers.	Total of Columns 2, 3, and 4	Horses.
At Home	1	2	3	4		
Active Army	25,695	38,500	41,224	404.044	483 768	113,988
Gendarmerie and Republican Guard	673	1,963	2,909	19,122	23,996	11 297
Total...	26,368	40,465	44,133	423,166	507,764	125,285
Algeria	2,150(1)	3,227	4.051	45,150	52.428(1)	12,429
Tunisia	691	1,082	1,351	14,169	16,902	3,722
Total ...	2,841	4,309	5,402	59,619	69,330	16,151
Grand Total ...	29,209	44,774	49,533	482,785	577,094	141,436

1. Of which 4 Officers and 139 Men are Gendarmerie.

The effective strength of the Colonial troops stationed in France, provision for whom is made in the War Budget (2nd Section) is 1,891 officers and 25,672 men, with 1,708 horses. Consequently the general effective strength of the army amounts to 31,000 officers, 602,766 non-commissioned officers and men. and 142,844 horses.

The co-efficient of deduction for absence—leave, absence in hospital, &c.—being fixed at 6.5 per cent., the net effective strength of the active army stationed in France amounts in round numbers to 452,000 men. Deducting 35,000 men roughly for auxiliary services—non-combatants—the strength of the Home active army fit to enter on a campaign is reduced to 417,000 men. or 441,000 men if the Colonial troops are added.

The calculation of the mean effective is settled by taking count of the co-efficients of the following losses :—

4 per cent. since incorporation (3rd October) up to the end of the year;

6·5 per cent. the following year;

2 per cent. the second year up to the time of release from service.

According to these bases, the effective of the 1907 class, which, at the time of its incorporation in October, 1908, amounted to 206,200 men for the active army, stands as follows :—

Effective in October, 1908	206,200
Losses (4 per cent.) up to 31st December, 1908 ...	8,200
Effective on the 31st December, 1908	198,000
Losses in 1909 (6.5 per cent.)	12,900

Effective on the 31st December, 1909	185,100
Losses in 1910 (2 per cent.) up to date of release (26th September)	3,700
	181,400

Effective mean in 1910 of the 1907 class :—

$$\frac{185,000 + 181,400}{2} \times \frac{269}{365} = 135,100$$

The effective mean of the contingent incorporated in 1909 (1908 Class) is calculated in the same way. With regard to the 1909 Class, which is only incorporated in October, the effective of the men for the active army is calculated at 46 per cent. of the male births of the year of the corresponding date (1889).

The co-efficient of loss of the permanent body ("*Engagés*"[1] and re-enlisted men) is fixed at 8 per cent. With regard to the men of the auxiliary service, their effective remains fairly constant, and there is no co-efficient of loss allowed in the calculation of the mean effective.

Native Troops.

According to M. Messimy, the Reporter of the Budget, the lowering of the effectives resulting from the progressive reduction in the birth-rate, will result in a loss of 11,000 men per class in 10 years, and of 26,000 men per class in 20 years—that is, a diminution of 154 battalions, or 5 army corps, and this even if the number of men furnished by the contingents annually is raised from 46 to 48 per cent.

The question of the employment of the black troops is thus being considered, and according to a study by Lieut.-Colonel Mangin, published in the *Revue de Paris*, these could provide in 12 years 48 battalions of Senegalese tirailleurs. These 48 battalions, grouped in 4 brigades of 2 regiments of 6 battalions, could be divided and form 2 divisions, which should arrive at Marseilles the 8th day of the mobilisation, leaving 20,000 native troops to protect Algeria.

On his side General Bonnal believes, and his view is shared by Generals Lacroix and Langlois, that with the means of transport at the disposal of France, and also with what England could provide, the passage from Algeria-Tunis to France of 120,000 men, Algerian and Senegalese, who would be almost indispensable for the winning of the first battle, should not meet with insurmountable difficulties.

But, as M. Berteaux, ex-Minister of War and President of the Budget Committee, remarked, these forces could only be brought into line three weeks after the first shock; and, on the other hand, the eventuality of an insurrectional movement breaking out in Africa at the moment when France and England found themselves engaged in a European conflict would not allow of abandoning the defence of Africa to native and Senegalese forces only.

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[1] The *Engagés* are the men who—previously to their being called out—sign a contract for long service, *i.e.*, for 3, 4, or 5 years.

France.

The possible participation of black troops in a Continental war has drawn forth energetic protests in Germany, as an article in the *Post* shows:—

"The African Army Corps, which has been able to render excellent service in Africa as pioneers of French civilisation, have no right to appear as French soldiers on the German frontier.

"The German soldiers ought to consider it an insult to have to measure themselves against these barbarians on European soil.

"We cannot admit that German soldiers may be once more exposed to the shock of the moral impression of such African hordes dressed up in French uniforms."

Without going as far as Lieutenant-Colonel Mangin and M. Messimy propose, the Government has voted a credit of £34,400 (Art. 89 *bis* of the Estimates) for sending, by way of experiment, a battalion of Senegalese riflemen to Algeria.

According to the declarations of the Minister of War and M. Waddington, the Reporter of the Budget in the Senate, it is the intention of the Government to be in a position gradually, by the employment of some Senegalese battalions and the reinforcement of some native regiments, to reduce the contingent which is sent annually from France to North Africa, and in this way strengthen the garrisons on the eastern frontier by a brigade of cavalry and one of infantry.—*Bulletin de la Presse et de la Bibliographie Militaires.*

Gratuities to Officer Aviators.—Officers and re-engaged non-commissioned officers, attached to the balloon troops or the aviation service, will receive a daily allowance fixed at 1s. 2d. for officers, 7d. for sergeants, and 4d. for other non-commissioned officers. Moreover, the "ascent gratuities" will be allowed to every soldier taking part on service, in ascents with any sort of machine. The rates of payment are fixed for officers and sergeants as follows:—

Aeroplanes—	Under two hours	4s.
,,	From 2 to 6 hours	12s.
,,	Over 6 hours	£1
Dirigibles—	From half an hour to 2 hours	4s.
,,	From 2 to 6 hours	8s.
,,	Above 6 hours	16s.

Free Balloon—2s. 4d., 4s., and 8s., under the same conditions of time as for Dirigibles.

For other soldiers, other than officers or sergeants, these rates are reduced by half.

In all that concerns Aeroplanes, the length of flights executed on the same day are reckoned as additional, except where the flight is less than 5 kilometres (3 miles).—*Bulletin de la Presse et de la Bibliographie Militaires.*

Germany. *The Testing of Explosives for Railway Transportation.—A Summary of the New Rules Embodied in the German Railway Regulations.* (W. Will and F. Lenze—*Zeitschrift für das gesamte Schiess- und Sprengstoffwesen.*)—After a long series of investigations, the German Commission appointed to formulate a code of rules to govern the acceptance of explosives for railway transportation has presented a provisional report which has been incorporated in the German Railway Traffic Regulations. Dr. W. Will and Dr. F. Lenze, who were responsible for most of the experimental work on which the specifications composing the report are based, have communicated to the *Zeitschrift für das gesamte Schiess- und Sprengstoffwesen* for 15th August, 1909, a brief review of the findings of the Commission, which is translated in the *Journal of the Franklin Institute* for January.

Explosives are classified under three fundamental groups, high explosives, powders, and other substances capable of explosion. The high explosives include ammonium nitrate explosives, organic nitro-compounds, nitrated chlorhydrin, nitro-cellulose, chlorate and perchlorate explosives, black powder and similar explosives, and dynamite and similar explosives. The powders include smokeless colloided nitro-cellulose powders with or without nitroglycerin, and black powder.

The investigations of the Commission have shown that certain explosives are safe to handle in unlimited quantities, others can be carried only in packages not exceeding 200 kilograms, still others can be carried only in special car loads. Under the first group are included the so-called ammonium nitrate explosives, the less dangerous nitro-compounds, damp nitro-cellulose and certain explosives similar to black powder. The second group include the more insensitive chlorate and perchlorate explosives, wet organic nitro-compounds which are more dangerous than picric acid, and nitrated chlorhydrin. Special car shipments are necessary in the case of dynamite, the more dangerous black powders, gun cotton and collodion cotton, and chlorate and perchlorate explosives.

"Powders may be forwarded in packages in unlimited quantities either as in the first group, including smokeless nitro-cellulose powders (also those containing nitroglycerin) which are well colloided and have certain definite conditions of stability, or as in the second group only in carloads, which include those nitro-cellulose powders which do not attain these conditions of stability, black powder for use as a propellant and similar powders. If certain regulations as to packing are followed, these shooting powders of the second group can be forwarded in packages in quantities up to 200 kilograms."

The admission of an explosive to railway transportation under any one of these groups is governed by the results of tests of its safety in comparison with that of well-known and comparable explosives tested simultaneously, which serve as standards. The tests determine comparative, not absolute, values. The researches of the Commission have shown that the properties most seriously influencing the safety of explosives in transportation are stability in storage, sensitiveness to mechanical influences, such as blows and friction, and inflammability and liability to explosion in fire or from the influence of high temperature generally.

Germany.

Of these the last appears to be the most important. Manufacturers may be relied on to furnish explosives of sufficient stability, and the risk of explosion by blows and friction is minimized by the enforcement of the rules for safe packing incorporated in the Railway Traffic Regulations. Tests to determine these three properties, however, are made in all cases. In addition a high explosive submitted for admission to transportation is subjected to a quantitative analysis and to tests to determine its reaction with litmus, its tendency to form salts, and other properties which may require investigation on account of the special nature of the explosive. For example, the composite ammonium nitrate explosives are tested for safety of intermixture by the shaking test; the ammonium nitrate explosives containing nitroglycerin are tested for the exudation of nitroglycerin on the addition of water; the simple nitro-compounds for their tendency to form salts; the nitro-celluloses for their content of water and alcohol, for admixtures and for stability under special conditions; the chlorate explosives for their safety of intermixture and their stability in alternate damp and dry storage; and the dynamites for their exudation of nitroglycerin by sweating in heat. For powders there are specified an investigation of the ingredients, and tests to determine their chemical stability and purity.

"The testing of explosives for storage stability consists of long-continued storage of 10 grammes in loosely closed bottles at about 75 degrees C. in thermostats or, better, in an oven heated by carbon tetrachloride. It is prescribed that the explosive shall be stored 48 hours without showing visible change, which may be recognized generally by the appearance of yellow fumes (nitrogen oxides), by a peculiar odour or colour, by large loss of weight, and so on. Actually, all the hitherto admitted explosives withstand this test for more than eight days. The method of storage at 75 degrees C. is especially adapted for the determination of stability, since the test carried out at a comparatively low temperature and extending over a long period of time more nearly simulates practical conditions than the so-called heat tests which are carried out at a considerably higher temperature (over 100 degrees C.) and are used for testing nitro-cellulose and nitro-cellulose powders for stability."

Sensitiveness to percussion is tested by means of the drophammer apparatus. In testing for liability to explosion, the object is to obtain data upon the tendency of explosives to detonate in case they should catch fire during transportation in large quantities, and also to determine whether a mass detonation is to be feared in such a fire. Four different tests are applied to each high explosive. Inflammability is tested by the action of the flash of a Bickford fuse on 3 grams of the explosive. The phenomena of decomposition by slow heating are determined by heating small samples of from 0·1 to 0·5 gram to explosion or complete decomposition, and the phenomena of combustion and eventual explosion by instantaneous over-heating, by throwing 5 grams on a red-hot iron plate. The effect of a fierce fire on a confined explosive is determined by calcining in a wood fire from 500 to 1,000 grams, according to the density of the explosive, in sheet iron cases. Experience has shown that the combined data obtained by these methods lead to a safe conclusion

Germany.

as to the liability of an explosive to explosion under the influence of high temperature. The liability to explosion of powders is tested by the behaviour of a charge of 0·54 gram in a Trauzl lead block when ignited by a fulminating cap.—*Engineering Magazine.*

Russia.

Wounds in the Russo-Japanese War.—The *Militärarzt* of 11th June, 1909, contains a *précis* of an article by Osten-Sacken in the Wogenno-med.shurn. of June, 1908. According to this writer, the losses by wounds in general and in the individual battles were only about 3 per cent. of the strength engaged. Individual units, however, suffered severely, thus the 6th Siberian Rifle Division at the battle of Mukden lost 31 per cent.; the 3rd Siberian rifle regiment at Sandchou lost 66 per cent. (95 per cent. of its officers); the 4th Regiment 53 per cent. (88 per cent. of officers).

The proportion of killed to wounded was 1 to 5·5.

The heaviest losses, about 46 per cent. of all wounds, occurred at ranges of about 500 paces; next to this, at 500 to 1,000 paces, about 28 per cent. of all wounds.

Artillery fire has become more effective. Of a total number of 10,055 casualties about 22 per cent. were shell wounds; many of these were skin wounds and bruises.

About 30 per cent. of the total number wounded were able to rejoin their units at the front.

There was no appreciable difference in the character of the wounds inflicted by the Japanese Murata rifle, of 8 mm. calibre and 1,881 feet initial velocity, and the Arisaka rifle, calibre 6·5 mm. and 2,451 feet per second initial velocity.

Projected Reform in the Russian Army.—(*Précis* of an article by Colonel Drygalski in *Neue Militärische Blätter*, Vol. 76, 1910).—In the secret sitting of the 29th December, 1909, a Bill was introduced in the Duma by the Minister of War for the complete reorganisation and redistribution of the Russian Army.

The present grouping is not homogeneous. As many as seven Army Corps have no cavalry divisions allotted to them in peace time. Some troops are not grouped in corps. Rapid mobilisation is rendered impossible by the fact that troops are not quartered in peace in the districts from which the bulk of their reserves must be drawn in war. Out of the 24 European Army Corps, 15½ are quartered in the small districts of Vilna, Warsaw and Kiev, and 6 more in the towns of Odessa and St. Petersburg.

It is expected that reforms will be carried out on the following lines:—

a. The bulk of the troops (except cavalry divisions with their artillery and the rifle brigades) will be withdrawn further east and will be quartered in peace in the districts from which their recruits are drawn.

b. The powers of the corps commanders will be increased and those of the district commanders curtailed.

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c. The number of corps will be increased by the grouping of units hitherto outside the corps organisation.

d. Arrangements in the Caucasus and Central Asia will remain the same as at present.

e. Every effort will be made to quicken mobilisation in the Pri-Amur, Irkutsk and Omsk Districts.

It is proposed to reorganise the reserve troops and the fortress infantry in field units.

The Guard, Grenadier and various rifle brigades will remain as at present.

The field artillery will be increased and the number of guns in each infantry division will be equalised—the probable strength per division being at least 8 batteries = 64 guns.

In order to ensure the co-operation of artillery and infantry in war the artillery of infantry and cavalry divisions and of rifle brigades will be placed under the commanders of those units in peace time.

Machine guns will be increased in number and will be attached to the infantry divisions to be formed from reserve brigades.

The technical troops, at present in homogeneous brigades, will be allotted to Army Corps and come under the Army Corps commander in peace time.

The strength of the cavalry will remain as at present.

These reforms are to be carried through as rapidly as possible without increasing the annual contingent of recruits and without permanent increase to the military Budget. The sum of 12½ million roubles has been estimated as the total cost. Of this amount over 11 millions will be spent in 1910, and of the remainder, half in 1911 and half in 1912.

It is doubtful whether either the time or the sum allotted will be sufficient.

New Regulations relative to the Periods of Instruction of the Reservists.—The organisation of the periods of instruction of the Reservists in the Russian Army dates from the year 1887; at that date there appeared "a Provisional General Regulation" relative to these periods, accompanied by instructions as to the duties of the military commandants of districts, the administration of the Reservists called out, and the employment of their time. In 1899 the Provisional Regulation was rendered definite. A recent *Prikaz* makes some modifications in it.

An important modification in the Regulations is that the Reservists will in future draw military clothing. Formerly they wore their civilian clothes and only received an allowance for their foot wear; now the corps in which they do their term give them a complete equipment and draw an allowance of 85 kopecks (2s. 8d.) for each Reservist clothed. As regards boots, if the Reservist keeps his own he receives the old allowance, 3 kopecks (1½d.) per day; if not, the corps furnishes him with them and draws the same allowance. Apart from this modification, which is of great importance, the new regulations contain long instructions in regard to the calling out, the preliminary assembly of the Reservists at the same centre, and the forwarding them by detachments to the corps to which they are assigned, etc. Whilst the Minister formerly settled the number,

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the arm, and the districts of the Reservists called out each year, this is now done by the staffs of the military districts concerned.

The regulations to be followed by the men called out and residing abroad are precisely laid down: A passport is only given them on their signing an engagement to rejoin their place of muster at the given time. To Reservists residing in distant parts of the country, certain facilities are also given.

The penalties are increased for Reservists who, without a legal reason, fail to appear after the lapse of a month.

The precise limits to the delay which may be granted for the medical or second medical inspection.

Regulations are also laid down for the professions which legally are not exempted from periods of instruction, but for which a preliminary arrangement between two departments is necessary. These are:—

The students at the higher educational establishments;
Reservists who have done their service in the corps of Frontier Guards;
The officials of the police of towns;
The heads of educational establishments;
The directors and professors of Government schools;
The district police.

No change is to be made in the papers to be kept or the measures to be taken by the military commandants of districts.

On the other hand, changes have been made in the method of instruction with the object of making it more up to date. The principle, however, is maintained of forming autonomous companies and battalions of the Reservists, with the understanding that from time to time they are to complete the active units and serve during one or two manœuvres with the war effectives.

The officers' and non-commissioned officers' cadres necessary for the formation and instruction of these Reserve units are chosen from the active cadres of the Army by the Chief of the Corps, who is responsible for the results of the instruction of the Reservists.

It is laid down that every endeavour is to be made to teach the men to act, fight, and fire independently, to fit them for service on patrols and reconnaissances, and to train the non-commissioned officers to carry out the duties of section commanders and detachments in all possible conditions in the field.

The first week is to be devoted entirely to individual training and handling of weapons. The instruction of the non-commissioned officers is to be carried out apart from that of the men. At the end of the period of training there will be a rifle match for the Reservists, at which prizes will be given. The inspection of the Reservists at the end of their period of training will be made by the generals commanding the districts. —*Revue Militaire des Armées Etrangères.*

CORRESPONDENCE.

THE ORGANISATION OF WELLINGTON'S PENINSULAR ARMY.

To the Editor of the JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION.

SIR,—I was unfortunately prevented from being present when Professor Oman delivered his lecture on "The Organisation of Wellington's Peninsular Army, 1809-14," but I have since had the pleasure of reading it in the August number of the JOURNAL. With most of his address there will be a general agreement; but there are two points, at any rate, about which I think the members of this Institution may well ask him for a little further information. A large proportion of us are military men, and naturally take a great interest in everything which tends to explain the reasons for the unbroken series of victories obtained by Wellington in Portugal and Spain. A good number, also, are readers of military history, and when we see a proposition made, like to look up the sources on which it is based. I venture, therefore, to ask Professor Oman kindly to give us in this JOURNAL a list of the authorities on which he has based his views with regard to the English and French skirmishers. These are, with reference to the latter, that the French limited their skirmishing line "to the voltigeur companies of each battalion in the regiment or brigade," and for the former that the English "skirmishing line was always stronger than the French, with the difference of about four to three, when the numbers opposing each other were anything like equal." I assume, of course, that by this he means the English open order line was usually stronger than that of the French, in the proportion of four to three. I may add that I have read Professor Oman's paper published in the "Proceedings of the British Academy" contributed "during the spring of 1910," approximately at the same time as his lecture was delivered. But it also contains no indications of the evidence on which he founds his statements with regard to the two heads with which I am dealing. Indeed, it renders them more obscure. For on p. 17 of his contribution, as published in pamphlet form, we are told "an Anglo-Portuguese division of . . . . eleven battalions in all . . . . had no less than eighteen light companies to send forward into its skirmishing line . . . . A French division of a similar strength of eleven battalions . . . .would undoubtedly send out only its eleven *voltigeur* companies." If this be correct, then the proportion was five to three, and not four to three, as given in the lecture.

I trust, therefore, Professor Oman will oblige us with a list of the records he consulted before writing these two contributions to military history. Some of them may already be in our library, others may not. In the latter case it is plainly desirable they should forthwith be procured. Even if some of them are in foreign archives, copies of them can be obtained.

I am, Sir,

Your obedient servant,

WALTER H. JAMES, *Lieut.-Colonel.*

In reply to Colonel James' letter, Professor Oman has kindly sent the following note:—

"So far as the English skirmishing line is concerned, the 'original authorities' are simply the fortnightly muster rolls of Wellington's army, to be found in the Record Office, bound up with his despatches. It will there be seen that, commencing in May, 1809, with the breaking up of the 5/60th, Wellington finally developed a system in which to each British brigade of the line there was attached a company of rifles, to add an extra allowance of light infantry to the three light companies of which such a brigade of three battalions was possessed. After 1811 he also added a whole battalion of Caçadores (rifles) to each Portuguese brigade. That the light companies and Caçadores normally formed the skirmishing line in every engagement, I need hardly explain. That is what they were meant for. The regiments broken up in order to give the extra rifle company to each brigade were the 5/60th, the Brunswick Oels Jägers, and to a certain small extent the light infantry battalions of the King's German Legion, and the 3/95th.

If Colonel James will look at the complete morning state of Wellington's army on 15th February, 1811, in the Record Office, he will see that the 5/60th gave a company each to the brigades of Stopford, Nightingale, Colborne, Hoghton, Lumley, Hulse, and three to that of Mackinnon. The 3/95 gave a company to Howard's brigade. The Brunswick Oels gave a company each to the brigades of Hay, Dunlop, and Houston, the light K.G.L. battalions two companies to that of Low [the K.G.L. line brigade].

That the brigade light companies were used together as a single first-line fighting unit, is sufficiently proved from many of Wellington's despatches. See, for example, the Fuentes de Oñoro report (Despatches vii., 529), where he speaks of "the light infantry battalion" of Nightingale's brigade, of Howard's brigade, of the K.G.L. brigade—these "battalions" being the four or five light companies united. They were all used, apart from the regiments to which they belonged, to hold the outlying village of Fuentes de Oñoro.

Space forbids me to quote strings of original French authorities or official papers to prove that the normal skirmishing line of a Napoleonic regiment was simply composed of its voltigeur companies. But perhaps Colonel James will accept the three following statements from the last three French authorities who have been studying the tactics of the Empire.

Balagny. *La Bataille de Bussaco*, p. 328. Les Français attaquèrent, comme ils le faisaient généralement à cette époque, en colonne serrée par division ou par peleton : les bataillons suivaient les uns derrière les autres. On lançait en avant une ligne de tirailleurs, *généralement formée avec les voltigeurs des corps.*

Morvan. *Le Soldat Impérial.* II., p. 263. En général une ligne de tirailleurs—*les voltigeurs*—prépare l'action. Derrière ces tirailleurs les bataillons s'avancent, ou bien s'immobilisent, sur trois rangs.

Dumoulin. *Précis d'Histoire Militaire*, 1792-1815, II., p. 90. Le régiment se forme en ligne deployée, les bataillons à intervalles variables, soit en colonne de bataillons, soit en ligne de bataillons en colonne. *Les tirailleurs ne sont plus formés que par 1 ou 2 peletons (compagnies) de chaque bataillon, ou par des regiments l'infanterie légère.*

Il est à remarquer qu'il [l'Empereur] né prévoit pas de ligne d'approche constitué par des tirailleurs, spécifiant formellement des feux de ligne, et le maintien du 5me Regiment (infanterie légère) en reserve. *Peut-être admet-il que chaque brigadier y emploiera les deux compagnies de voltigeurs de ses deux bataillons de première ligne.* [*Ibid*, p. 92.]

[This last is to explain Napoleon's tactical note on infantry battle-formations sent to Soult in 1805, *Correspondance* No. 9527, of which the curious point is that the light infantry regiment of the division is *not* used in its skirmishing line, as we might have expected, but placed in reserve. For reasons hard to fathom, in the later campaigns no general attempt was made to differentiate in function between line regiments and light infantry regiments. *e.g.*, at Bussaco Merle's division, consisting of one line and two light regiments. advanced with the line regiment (36th) in front and the 2nd and 4th Light following it.]

Colonel James' last difficulty—his query why I speak in one lecture of the proportion between a French and a British skirmishing line as three to four, and in another as eighteen to eleven, companies—can be answered very simply. The three to four proportion comes when a British brigade of three battalions sends three light companies, plus a rifle company, to face the three voltigeur companies of a French regiment, also composed of three battalions But when *divisions* on each side are opposed in equal numbers, the normal Anglo-Portuguese division of two British and one Portuguese brigades has (1) six British light companies, (2) two British rifle companies, (3) four Portuguese light companies from the four line battalions of that nationality, (4) a whole six-company battalion of Caçadores. Therefore it sends out eighteen light infantry companies. The French eleven-battalion division will only send out eleven voltigeur companies, which will be overwhemed."—C. Oman.

NAVAL AND MILITARY CALENDAR.

OCTOBER, 1910.

5th (Wed.) Revolution in Portugal: Republic Proclaimed: Flight of King and Royal Family.

11th (Tue.) H.M.S. *Inflexible* paid off at Chatham.

" " T.R.H. the Duke and Duchess of Connaught left Portsmouth on board *Balmoral Castle* for South Africa.

12th (Wed.) H.M.S. *Inflexible* recommissioned at Chatham.

28th (Fri.) H.M.S. *Britannia* paid off at Portsmouth.

29th (Sat.) H.M.S. *Britannia* recommissioned at Portsmouth.

31st (Mon.) T.R.H. the Duke and Duchess of Connaught landed at Cape Town.

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UNITED STATES.—*Journal of the Military Service Institution.* Governor's Island, New York: November-December, 1910.—"Practical Military Instruction." "Plan for Promotion in the Army." "Tactical Employment of Machine Guns." "Legal Rights and Duties of Post Commanders." "The German Army." "Musings of a Superannuated Soldier." "Hollow-Handled Entrenching Tool for Infantry." "The Moral Equivalent of War." "The Regular Army in Civil War." "Types and Traditions of the Old Army." "Comment and Criticism."

Journal of the United States Artillery. Fort Monroe, Virginia: September-October, 1910.—"Notes on 3-Inch Practice." "The Manufacture of Smokeless Powder." "Instruction of the Coast Artillery Reserves, National Guard, New York, Season 1910." "Experiments in Directive Wireless Telegraphy and Other Means for Securing Selectivity." "The New York Reserves at Target Practice."

NOTICES OF BOOKS.

The Life of Major-General Sir Charles Wilson, R.E., K.C.B., K.C.M.G., F.R.S. By Colonel Sir CHARLES WATSON, K.C.M.G., late R.E. London: John Murray, 1909. Price, 15s. net.

The name of Sir Charles Wilson is inseparably and mainly connected with the close and the failure of the final effort made by soldiers to redeem the broken pledges of politicians, in effecting the rescue of Charles Gordon, but he had already established a high reputation in other and less purely military walks of life before he was called to accept high military command under circumstances of unusual difficulty. In the early days of his service in the Royal Engineers, Charles Wilson was employed upon the North American Boundary Commission in the demarcation of the border line from the Great Lakes to the Pacific, which had been generally agreed to in the Treaty of 1783, but which had never been really properly delimited. Shortly after the conclusion of this service he volunteered for employment on the Ordnance Survey of Jerusalem, and there and thereafter did valuable work in connection with the scientific exploration of Palestine and the Sinai Peninsula. Returning home, he was appointed to the Ordnance Survey in Ireland; but the experience he had gained in the near East was too valuable to be overlooked, and he was appointed by Lord Salisbury to assist on the Servian Boundary Commission—special work which led to his being offered the post of Consul-General in Asia Minor and afterwards to his being called to Egypt as Commissioner with the Turkish Contingent, which was to have co-operated with the British Force sent to suppress the Mutiny of the Egyptian Army. The rapidity with which the military operations were brought to a close rendered unnecessary the despatch of any expeditionary force from Turkey, and Wilson's semi-military position having thus been abolished, he was then appointed by Sir Garnet Wolseley to be in a measure a political intermediary between the local Government and the British troops. He was thus responsible for the safe custody and regular trial of all the Egyptian officers who had been implicated in the revolt, and of their leader, Arabi Pasha, in particular, and it was entirely due to his tact and unremitting labours that a difficult situation was satisfactorily smoothed. It was during his stay in Egypt that he was offered by Lord Dufferin the appointment, which, however, he refused, of Governor-General of the Soudan. It is impossible now to hazard an opinion as to how and to what extent the appointment of Sir Charles Wilson, or any other man, might have preserved the province of Egypt, and held back the forces of fanaticism and savagery; but from the extracts which the compiler of this book gives us from Sir Charles Wilson's letters, reports and conversations, there can be no doubt that he had gauged the situation with really remarkable accuracy and prescience.

Not many months after Sir Charles Wilson had returned home and resumed his work in Ireland as Chief of the Ordnance Survey, the Nile Expedition of 1884 was decided upon, and he was offered by Lord Wolseley the position of Chief of the Intelligence Department. He accepted; he spent some time, during the preparatory stage of the expedition, at and beyond Dongola endeavouring to collect information; and when Sir Herbert Stewart started upon his desert march, Sir Charles Wilson was directed to accompany him in a somewhat peculiar capacity and bearing a constricted mission. He was to be a staff officer and yet no staff officer; he was under certain circumstances to take the place of his commander, and when it might become possible to open communications by river between Metemmeh and Khartoum, he was to go to Gordon, hand him a letter from Lord Wolseley, and then return to Army Headquarters as speedily as possible. The story of all the unforeseen circumstances which arose has already been told in "From Korti to Khartoum," and that book and this biography together effectually defeat the attempt which at the time was made to fix upon Charles Wilson the chief responsibility for the failure of the attempt to relieve Charles Gordon. That the nation will have its scapegoat we all know; we all regret that the selection is not always just; but it is even more regrettable that the pages of this book provide indications that those who were in possession of all the facts did not hesitate to try and fix the responsibility for failure upon one who, under conditions of unparalleled difficulty, did all for success that man could do. Sir Charles Watson has given us in this biography a very good idea of his friend, of his energy, his wide knowledge, of the thoroughness with which he achieved the work of his varied and interesting and useful life. It is also a vindication, but most men have long since formed a just opinion upon whom should be laid the responsibility for a failure which Sir Charles Wilson and those with him did their utmost to make a success.

Machine Gun Tactics. By Captain R. V. K. Applin, D.S.O., 14th Hussars. London: Hugh Rees, Ltd., 1910.

Captain Applin writes both as an enthusiast and as an expert, and has succeeded in producing a singularly useful manual which deserves to be adopted as a text-book throughout our Army. He puts very clearly before us the peculiar capabilities of machine guns, provided they are properly mounted and organised, and their detachments efficiently trained and carefully led; he also tells us how these conditions can best be arrived at. Commencing with a detailed description of the modern machine gun, the author passes on to a comparison of the efficacy of its fire as compared with that of a body of riflemen, and then discusses the factors of mobility, visibility, and vulnerability, which must be considered in forming any determination of its tactical value. In regard to the question of mobility, most of us will probably agree with Captain Applin that while our present gun on tripod mounting is light and inconspicuous, these advantages are almost neutralised by the gun being carried on a wagon, thus confining it almost entirely to ground suitable for wheeled traffic. He urges that the gun ought to be at least as mobile

as horse artillery, and that there does not appear to be any valid reason why it should not be equally mobile with cavalry; and that it is desirable for infantry, and absolutely essential for the mounted arm, that pack transport should be definitely adopted for machine guns with us as it already has been in the majority of foreign armies. The author then goes on to discuss in detail the tactical employment of machine guns with the independent cavalry, with the protective cavalry and with infantry, in fortress warfare and in minor operations; his arguments and deductions are illustrated and strengthened by numberless examples, drawn from the experience of modern campaigns and small wars; and he shows us very convincingly how these weapons may co-operate with the other arms in the attack, in the defence, and in the pursuit, while he goes far towards proving that in all three there is hardly an imaginable situation wherein machine guns, properly organised and effectively handled, may not play a very decisive part.

Finally, Captain Applin closes with a complete and interesting account of the system and organisation, and, in some cases, the tactical employment of machine guns in the different armies of the world. His well-reasoned manual may be confidently recommended to the close attention of his comrades of all arms of our Service.

PRINCIPAL ADDITIONS TO LIBRARY, OCTOBER, 1910.

A Text-Book of Colloquial Japanese. By Dr. RUDOLF LANGE. Revised English Edition by CHRISTOPHER NOSS. 8vo. 16s. (Methodist Publishing House.) Tokyo, 1907.

Etude sur les Pistolets Automatiques. By Le Commandant E. NIOTAN. 8vo. (Presented.) (Revue de l'Armée Belge.) Liège, 1910.

The Campaign of Chancellorsville: A Strategic and Tactical Study. By JOHN BIGELOW, Jr. Imp.8vo. 50s. (Presented.) (Henry Frowde.) London, 1910.

Dupleix. By Colonel JOHN BIDDULPH. Crown 8vo. (Presented.) (F. V. White & Co., Ltd.) London, 1910.

La Régénération de la Prusse après Jéna. By Captain J. VIDAL DE LA BLACHE. 8vo. 5s. 8d. (Berger-Levrault et Cie.) Paris, 1910.

Cavalry Taught by Experience: A Forecast of Cavalry under Modern War Conditions. By "NOTROVE." 8vo. 2s. 6d. (Presented.) (Hugh Rees, Ltd.) London, 1910.

Story of the Franco-Prussian War. Part II.—From Metz to Sedan. By Lieut.-Colonel H. M. E. BRUNKER. 8vo. 2s. 6d. (Presented.) (Forster Groom & Co., Ltd.) London, 1910.

Afghanistan: The Buffer State. Great Britain and Russia in Central Asia. By Captain GERVAIS LYONS. 8vo. (Presented.) (Higginbotham & Co.) Madras, 1910.

Artificial and Natural Flight. By Sir HIRAM S. MAXIM. 8vo. 5s. (Whittaker & Co.) London, 1909.

Britain Across the Seas: Africa. By Sir HARRY JOHNSTON. 8vo. 10s. 6d. (National Society's Depository.) London, n.d.

My Life and Acts in Hungary in the Years 1848 *and* 1849. By General ARTHUR GÖRGEI. 2 Vols. Crown 8vo. 2s. 6d. (David Bogue.) London, 1852.

Memoirs of the Lives of Robert Haldane of Airthrey, and of His Brother James Alexander Haldane. By ALEXANDER HALDANE. 8vo. 1s. 6d. (Hamilton, Adams & Co.) London, 1852.

Letters from Germany and Holland during the Years 1813-14, *Containing a Detailed Account of the Operations of the British Army in those Countries, and of the Attacks upon Antwerp and Bergen-op-Zoom by the Troops Under the Command of General Sir Thomas Graham, K.B.* Crown 8vo. 1s. (Thomas & George Underwood.) London, 1820.

Sketch Map of the Russo-Turkish Campaign in Bulgaria, 1877-78. 8vo. 2s. 6d. (Presented.) (Forster Groom & Co., Ltd.) London, 1910.

Historical Records of the Governor-General's Body-Guard. Compiled by Lieutenant V. C. P. HODSON, 10th D.C.O. Lancers. 8vo. 31s. 6d. (W. Thacker & Co.) London, 1910.

Official History (Naval and Military) of the Russo-Japanese War. Prepared by the Historical Section of the Committee of Imperial Defence. Vol. I. and 1 Vol. Maps. 8vo. 15s. (Harrison & Sons.) London, 1910.

L'Aviation. Nouvelle Edition. Par le Capitaine FERBER. 8vo. 3s. 9d. (Berger-Levrault et Cie.) Paris, 1910.

Guerre des Communeux de Paris, 18 *Mars—*28 *Mai,* 1871. *Par un Officier Superieur de l'Armée de Versailles.* Crown 8vo. 4s. 6d. (A. N. Lebegue et Cie.) Brussels, 1871.

Trade Conditions and Crime on Navigable Waterways in Bengal, Assam and the United Provinces, 1904-06. A Paper read before the Bengal Chamber of Commerce by Mr. P. B. BRAMLEY, District Superintendent of Police (Benares). Published by Authority. fcap. fol. (Presented.) (Bengal Secretariat Press.) Calcutta, 1907.

Report on River Crime and River Police Reorganization Scheme. By Mr. P. B. BRAMLEY, Superintendent of Police, United Provinces. 3 Parts. fcap. fol. (Presented.) (Bengal Secretariat Press.) Calcutta, '907.

The Buccaneers in the West Indies in the XVIIth Century. By C. H. HARING. 8vo. 10s. 6d. (Methuen & Co., Ltd.) London, 1910.

Letters of the English Seamen: 1587-1808. Edited by E. HALLAM MOORHOUSE. 8vo. 10s. 6d. (Chapman & Hall.) London, 1910.

Private Letters of the Marquess of Dalhousie. Edited by J. G. A. BAIRD. 8vo. 15s. (William Blackwood & Sons.) London, 1910.

The North Pole. By ROBERT E. PEARY. Crown 4to. 25s. (Hodder & Stoughton.) London, 1910.

A Veteran of 1812. *The Life of James Fitzgibbon.* By MARY AGNES FITZGIBBON. Crown 8vo. (Presented.) (William Briggs.) Toronto, 1894.

India and Tibet. By Sir FRANCIS YOUNGHUSBAND. 8vo. 21s. (John Murray.) London, 1910.

RECENT PUBLICATIONS OF MILITARY INTEREST.

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PREFATORY NOTE.

This Pamphlet will be issued quarterly, in April, July, October and January. Its purpose is to draw the attention of Officers to British and Foreign publications of Military interest which are likely to assist them in their professional work. Copies of the pamphlet will be distributed to the Headquarters of Commands Educational Establishments, Units and Reference Libraries.

PART II.[1]

SECTION I.

ARTILLERY.

The Spanish Regulations for the Tactical Training of Field and Horse Artillery (Reglamento para la Instrucción Tactica de las Tropas de Artillería Montada y a Caballo). Spanish General Staff. 320 pp. 8vo. Madrid, 1910. Eduardo Arias. 1/9.

The first 260 pages of this manual are taken up with a description of the drill, organisation, instruction, and armament of field and horse artillery. The remaining pages deal with the tactics of that arm, the actual method of firing being contained in the "Regulations for F.A. fire" (see R.P.M.I., July, 1910, p. 253).

The Artillery Brigade is composed of three batteries, each of four guns. The battery is organised in two echelons, the first consisting of four guns and five wagons, the second of five wagons; the distance between the two will usually be 500 yards.

Emphasis is laid on the necessity for selecting a covered approach to a position; any time spent in selecting a good line of approach will be more than repaid by the increased effectiveness of fire once the position is reached.

The Regulations state that it is impossible to lay down whether direct or indirect laying is the preferable system; the method to be employed must depend on the lie of the ground, the tactical object and the action of the enemy. As a rule it is better to take up indirect positions during the earlier stages, but when the advance of the enemy's infantry begins it will almost always be necessary for at any rate some of the batteries to come up to the crest and to lay direct. The great object of artillery is to support their infantry as effectually as possible, and to do this they must be prepared to lose heavily if necessary.

Communications.—Telephones and visual signalling must be the means of communication between the brigade commander, the battery commander, and the observing station; a service of orderlies should also be organised, especially for communication between the two echelons of a battery.

The observing station will be organised by the Brigade-Major.

Ammunition Supply.—The order to the second echelon to replenish ammunition should come from the Brigade Commander, except when a battery is detached. When the second echelon has begun to replenish the wagons of the first echelon the ammunition column should be advised to send forward fresh ammunition wagons; these should not, however, be brought far enough to the front to get under fire. The second echelon should never remain on a road. Before a change of position, the first echelon will always complete their ammunition if possible.

The conduct of fire.—No batteries will open fire without an order from the Brigade Commander; strict orders as regards opening fire will be given to artillery forming part of an advance guard. In both cases this only applies to the first shot in an action.

In the earlier stages of an action, batteries will be divided as folows:—

(*a*) Batteries to deal with the enemy's artillery.
(*b*) Batteries to deal with the enemy's infantry.
(*c*) Batteries in readiness.

As, with anything like equal numbers, it is impossible to expect to obtain marked artillery superiority everywhere, fire will usually be concentrated on important points or zones.

Horse Artillery.—The Horse Artillery accompanying a cavalry force must be under one central control; the officer commanding this Horse Artillery will accompany the G.O.C. cavalry in any personal reconnaissance that may be undertaken, and will receive general instructions as to the rôle he is to adopt; he will then issue definite orders. The usual target for the Horse Artillery in the cavalry combat will be the first line of the hostile cavalry; fire should be concentrated on the first line until this fire is masked by the advance of one's own cavalry, when the enemy's second or third line will be dealt with.

The escort to Horse Artillery will usually consist of one section to a battery, one squadron to a brigade of three batteries.

Higher Artillery Command.—(*a*) The general commanding the artillery of an army.

This officer has executive control over the artillery directly under the control of Army Headquarters and over all artillery parks not forming part of the organisation of army corps or divisions. He acts as artillery adviser to the Army Commander; he further acts as inspector of the corps or divisional artillery, but has no executive control of these units except in the exceptional case of the artillery of several corps or divisions being massed under one central control.

(*b*) The general commanding the artillery of an Army Corps.

This officer exercises direct control over, and issues orders to, the corps artillery and corps artillery parks; he organises a system of communication for all units under his own direct command. As artillery adviser to the Corps Commander, he will reconnoitre before an action has been begun, with a view to arranging for the general distribution of the divisional as well as the corps artillery. He will only exercise direct executive control over the divisional artillery when the latter are massed for some special purpose. When any special method of ammunition

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1 The titles of all books are given in English; this does not indicate that the books have been translated. The original title in the language in which a work is written, if not in English, is given in brackets.

supply is to be adopted other than that laid down in the regulations, he will make the necessary arrangements.

(*c*) The duties of the officer commanding divisional artillery are on the same principle as those of the G.O.C. Army Corps Artillery.

The Service of Coast Artillery. By F. T. Hines and F. W. Ward, of the United States Coast Artillery. 547 pp., with numerous illustrations and index. 8vo. New York, 1910. Goodenough and Woglom.

This publication gives a good general idea of coast defence as practised in the United States. Although not sufficiently advanced from the artillery officer's point of view, the collection of information should be of great use to other arms engaged in the defence of a coast fortress.

Chapter I. contains a very complete set of definitions of terms likely to be met with in coast artillery work.

Chapter II.—*Theory and principles of coast defence.*—The advantages which coast defence batteries possess over ship's batteries are put forward clearly. A discussion on the probability of ships attacking coast defences, and the great value of mines as obstacles to ships running past into inner waters is given. Mines are apparently used by the U.S.A. because occasions may present themselves, during which the local naval defence flotillas may be withdrawn for offensive purposes and thereby the coast defences be deprived of their assistance. Under the heading of landing attacks, the probability of these under different circumstances is impressed on the reader, but the most difficult problem, viz., the defence against small landing parties, is very briefly dealt with.

Chapter III. gives a short description of the organization and personnel of a coast fortress.

Chapter IV. deals with gunnery and ballistics. This chapter might be amplified with advantage and mathematical formulae omitted; it is clearly and interestingly written.

Chapter V.—*Armament.*—This is a long chapter which gives too much detail for the ordinary reader and yet cannot supplant the handbooks of the various guns. It is, however, interesting to see the good purpose to which electricity is employed by the U.S.A. in giving power and light for the working of the armament.

Chapter VI. contains a good description of ammunition employed; it is, however, marred by indistinct and indifferent plates and illustrations.

Chapter VII.—*Instruments, devices and charts.*—A description of range finders, including their manipulation, is given. Corrections for tide and refraction are arranged for when calculating datum, for which operation three datum points are used. For low sites, ranges and trainings are taken at intervals of 15 or 30 seconds, depending on the nature of gun; these are transmitted to a central station plotting board, when, by means of arms and arcs, they are commuted to ranges and trainings for the guns.

Range boards are used for mechanically computing calculations of ballistic and other corrections for the guns as regards range, and deflection boards perform similar functions for deflection corrections.

The Telautograph instrument is used to transmit data from plotting stations to gun emplacements. Its advantage over the telephone is the elimination of delay and errors which often accompany verbal communications by telephone. The instrument, however, necessitates a high voltage current with the use of secondary batteries.

Some useful and simple directions for the use of telephones, barometers and anemometers are given, but the description of sights is too detailed for the ordinary reader and insufficient for the student.

Chapter VIII.—*Searchlights.*—The fighting range of lights is stated to be 8,000 and 5,500 yards for the 60 and 36 inch reflectors respectively; climatic conditions, however, are not stated. The intensity of the light due to candle-power is considered by the U.S. to be the main factor of increase of range.

Chapter IX.—*Submarine mines.*—Electric contact mines only are considered. Their location is from 4,000 to 8,000 yards from the main defences of a harbour, and it is thought at least three lines are essential, the water area in which they lie being defended by submarines, torpedo boats and quick-firing guns of the land defences. The method of planting and various operations in mine laying are touched upon.

Chapter X.—*Sea coast engineering.*—The method of surveying for finding the lengths of bases and determining the co-ordinates of their ends is described. The determination of heights of guns and range-finding instruments and the orientation of the same is explained.

Chapter XI. touches on the question of stores for moving guns and material; this chapter might with advantage be amplified.

Chapter XII.—A description of the magazine rifle and its ammunition, together with points on the care and preservation of the weapon.

Chapter XIII.—*Points for coast artillerists.*—This is practically an appendix containing instructions for fighting battle and fire commands, and for peace practice: hints for B.C.'s, including points to look at in preparation for action; and the method of calibrating guns and finding their errors. It is interesting to note the use of the camera as an adjunct to rakes and range-finding instruments. The conclusion that the calibration committee arrived at was that the mounting and jump were the main factors in the accuracy of shooting of guns.

In fighting a battery command the range corrections are worked out by the B.C. and the deflection by the gun layer.

Signalling between tug and battery at practice is carried out by cone, tug's whistle, and flag. At night the battle commander's searchlight is used.

The duties of specialists such as tide observers, meteorological observers, &c., are enumerated; and camp sanitation is briefly discussed.

Modern Guns and Gunnery. By Colonel H. A. Bethell. 444 pp., with many illustrations. 8vo. Woolwich, 1910. Cattermole. 15/-.

This elaborate compilation probably contains more information, both technical and general, concerning guns and gunnery of Horse and Field Artillery than any book in the language. Every branch of the artillery science useful to those in the field is exhaustively and clearly dealt with. It is to be hoped that the intending reader of moderate mathematical attainments will not be dismayed to learn from a perusal of the preface to the third edition, that "Siacci's Beta function enables us to solve trajectories in one arc." There is nothing alarming in the body of the book, and it contains a fund of information which may be profitably tapped by readers of all ranks.

Many of the chapters are specially valuable as supplying information that is either not to be found in the ordinary text books or else, as in the case of the text book of Gunnery, is so involved as to be somewhat difficult to extract. For this reason the chapter on "Ballistic tables and their use" and those on "The Principles of Construction of Guns, Carriages and Ammunition," should be read by all artillerymen, whilst Part III., on "The Science and Methods of Artillery Fire," should prove highly instructive to soldiers of all arms.

Part IV., on "Modern Q.F. Equipments," should be of considerable value as a book of reference to amateurs and experts alike, and Part V. a useful assistance to specialists and instructors as well as to the ordinary student. There is a comprehensive index.

Sketches of Manchurian Battlefields. By Major A. I. R. Glasfurd, I.A.

This book of panoramic sketches drawn on the battlefields of Manchuria is a valuable addition to the existing literature on the Russo-Japanese War. The presentment of the ground is accurate and realistic, and the relative values of the various tactical points are graphically demonstrated.

The letterpress accompanying the sketches is simply a statement of such characteristics of the ground as cannot be shown in the pictures.

The Operations in Sakhalin During the Russo-Japanese War (Die Kämpfe auf der Insel Sachalin während des russich-japanischen Krieges). By Ritter von Ursyn-Pruszynski. 58 pp. 3 maps. 8vo. Vienna, 1910. Karl Prochaska. 2/6.

The introduction of this work describes the military geography of Sakhalin, the administration of the island, the garrison before the war, and the various schemes suggested for defence.

The operations on North and South Sakhalin are described separately, and the events in each are related in detail both from the Russian and from the Japanese point of view.

The Russians had left Sakhalin with a weak garrison, and they realised that a Japanese invasion could not be prevented. Their aim was to give the Japanese as much trouble as possible, and to retain a footing in as many places as possible, so as to strengthen their claim to the island in the peace negotiations. The Japanese employed only reserve troops, but their task was even easier than they had anticipated, their command of the sea rendering them free from interference and facilitating supply. The chief cause of the Russian failure was their lack of preparation. They divided their forces into five bands, which were intended to carry on guerilla warfare in their respective areas. When well led, these bands fought gallantly, but they were ill-trained, ill-armed, and scantily supplied: many valuable stores had to be destroyed on the coast for lack of transport; and adequate entrenchments had not been constructed to protect the passes which were the strategical keys to the island. The story tends to prove that preparation is as necessary for guerilla warfare as for regular war.

Hood's Texas Brigade. By J. B. Polley. 347 pp. 8vo. Illustrated. New York and Washington, 1910. The Neale Publishing Co. 16/-.

Of the Texas Brigade a Librarian of Congress wrote, "The known statistics of these regiments are so remarkable that if missing figures can be obtained it will establish a record equalled by few, if any, organisations in the Civil War, or indeed in modern warfare," and Hood, its first real commander, says, "Its signal achievements in the war of secession have never been surpassed in the history of nations." The author, who served as a private in the 4th Texas, shows that this claim is well founded.

The nucleus of this famous brigade consisted of the 1st, 4th, and 5th Texas Regiments of Infantry, which at the end of 1861 were formed into a brigade in conjunction with the 18th Georgia Regiment under the command of Brigadier-General Wigfall. Early in the following year Wigfall was succeeded in command by Brigadier-General J. B. Hood, who till then had been colonel of the 4th Texas. Under his command the brigade received its baptism of fire on the 7th May at Eltham's Landing, where it was engaged with part of Franklin's division, but the encounter did not rise above the dignity of a skirmish. After this it was strengthened by the addition of the infantry of Hampton's Legion,

but took no active part in the battle of Seven Pines. In June it was sent with Whiting's brigade to the Shenandoah Valley to reinforce "Stonewall" Jackson. It formed part of his command during the seven days' fighting round Richmond, and made its name in the battle of Gaines' Mill, where it was the first to break Porter's lines. The honours of the day were won by the 4th Texas, which captured 14 guns; and the 5th Texas distinguished itself by the capture of a whole Federal Regiment. The total loss of the brigade in this battle was 128 killed and 428 wounded. The claim advanced 12 years ago that it was Pickett's brigade which captured the Federal artillery is examined and rejected by the author, for reasons which seem entirely convincing.

After the relief of Richmond, Whiting's and the Texas Brigades were restored to Longstreet's command, and formed a division temporarily under Hood's command, who still retained the command of his original brigade. In the battles of Second Manassas and Sharpsburg the Texas Brigade bore a most distinguished part. The 30th August was the day of the 5th Texas which, after almost annihilating its old enemy, the 5th New York Zouaves, "slipped the bridle," pursued the retreating Federals to the Chinn House, and assisted in dislodging them from that strong position. But the lack of a proper brigade commander caused the regiments to become widely separated, and somewhat impaired the efficiency of the brigade as a unit. In the Maryland campaign the brigade was commanded by Colonel Wofford, of the 18th Georgia. The brunt of the fighting on the 17th September was borne by the 5th Texas, which, going into action 226 strong, lost 45 killed and 141 wounded, whilst the loss of the whole brigade in that battle was 560 out of 854 men engaged.

On the reorganisation of Lee's army in October, 1862, Hood was promoted Major-General and given command of a division composed of the Texas and three other brigades. The 18th Georgia and Hampton's Legion were transferred to other brigades; and in their place the 3rd Arkansas was attached to the Texas Brigade, which was now placed under the command of Brigadier-General J. B. Robertson, late colonel of the 5th Texas, but it continued to be known throughout the war by the name of Hood's Texans. It took no active part at Fredericksburg, and missed Chancellorsville. In the Gettysburg campaign it was heavily engaged on the second day in the historic struggle in Devil's Den, and lost 87 killed and 329 wounded. Though no great admirer of Longstreet, the author is plainly disposed to acquit him of the charge of having caused the loss of the battle. He takes the view that Lee's plan of attack was not made known to Longstreet till nearly noon of the 2nd July, owing to the delay of the officers sent by Lee at daybreak to reconnoitre the ground, for whose report he was impatiently waiting: that Longstreet's movement was delayed, not owing to the Corps Commander waiting for the arrival of Law's brigade, but because Anderson's division of the Third Corps did not get into position till 1 p.m., and it was not till this division was in line of battle that Lee sent General Pendleton to conduct Longstreet's command to its position. "Of whatever needless delay, slow and deliberate movement, and unwillingness to give battle General Longstreet may be accused and may have been guilty, there was yet abundance of time after the divisions of Hood and McLaws went into action, in which, by united effort, to drive the Union army from its stronghold and put it to rout."

In September, 1863, Hood's division was sent to reinforce Bragg in Tennessee, and took part in the battle of Chickamanga. The author makes some interesting observations about the difference in fighting methods between the armies of the West and East. Both Rosecrans' and Bragg's armies were accustomed to "stand up and fire" and "lie down and shoot" fights, but were unaccustomed to "the wild charges so common in Virginia." The brigade was next engaged on the 20th October in the night attack made by Hood's division, now under General Jenkins' command, upon Hooker's force at Wauhatchie. The Texans resented the appointment of Jenkins over the head of Law; and the veteran troops of the division were unwilling to engage in a night attack. Of the Texas Brigade only the 4th Texas was in the firing line, and its headlong stampede from Raccoon Mountain is humorously described by one of the participants. When Longstreet was given discretionary authority in December over all the Confederate forces in East Tennessee, he seized the opportunity to rid himself of some of his subordinates. At his instance Jenkins preferred charges against General Robertson, and though these were very properly quashed by the President and the Secretary of War, Robertson, rather than remain under Jenkins' orders, resigned his command, and was succeeded by Brigadier General Gregg. In the Wilderness campaign the Texas Brigade came up just in time to stop the rout of Wilcox's and Heth's divisions, and to drive back Hancock's pursuing troops. At Spottsylvania it was almost surprised on the evening of the 10th May by Upton's assault, but took no part in the desperate fighting at the "Bloody Angle" on the 12th May. Nor was it directly attacked at Cold Harbour on the 3rd June, although it contributed to the repulse of the Federal attack by pouring in a heavy fire upon their left flank. The brigade was relieved from duty in the Petersburg lines just before the explosion of the Burnside mine, and sent to the north bank of the James River, where it remained till the evacuation of Richmond, taking a prominent part in the engagements of the 29th September and the 27th October. General Gregg was killed during a reconnaisance in force on the 17th October, when the brigade lost more heavily than in any engagement since the Wilderness. He was the last officer holding the rank of Brigadier-General that commanded the Texas Brigade. The brigade when it surrendered at Appomattox numbered 557 officers and men.

The author has had an inspiring theme, and has told his story well; but his method of treating his subject leaves something to be desired. His original

plan was to give the unofficial reports of the brigade and regimental commanders, and to supplement these by unofficial accounts representing the point of view of the soldier in the ranks. By this means a vivid and picturesque description is secured of the various battles. But Mr. Polley has hardly been at sufficient pains to reconcile the discrepancies of the different versions, and the picture which he presents is somewhat lacking in unity. He has been content to let each witness tell his own story without editing the various contributions submitted to him.

Owing either to lack of space, or want of sufficient material, the narrative after Gettysburg becomes distinctly meagre. This is especially the case with the account of Chickamanga, where, besides an extract from Hood's "Advance and Retreat," a purely personal and very disjointed description from the pen of a nameless participant is the sole record supplied of two days' hard fighting. The statistics of losses incurred in the later battles seem not to be on record, but the author has not attempted to make good that deficiency even approximately.

On page 154, 4 p.m. should be 4 a.m.; and the statement on page 241 that the Confederate position at Cold Harbour in 1864 faced north-west is inaccurate. Then, as in 1862, Lee's army faced east, covering Richmond.

The Riff Campaign 1909 (La Campana del Rif). By Captain Gallego. 882 pp., with numerous sketches. 8vo. Madrid, 1910. A. Marzo. 4/6.

Captain Gallego's book is the most complete record that has yet appeared of the Melilla campaign. In Part I. a description is given of the gradual development of the Spanish policy in North Africa, of the treaties drawn up by the various Powers interested in the country, and of the events leading up to the outbreak of hostilities in July, 1909. In Part II. the campaign is described. The comments of the author, which are reserved for the end, are clear and very unbiassed, and refer to all arms and departments of the Expeditionary Force. The author justly claims that the mobilisation of the force and the subsequent despatch of reinforcements were carried out more smoothly than in any other war conducted by Spain, while the army was well found in quick-firing guns, wireless telegraphy, motor cars and lorries and all the modern requisites of an army. Stress is laid upon the defensive spirit animating the strategy and tactics of the campaign compared with the North African war of 1859-60, the dominant note of which was a resolute offensive. The method of training the troops, especially the cavalry, is criticised with some severity.

In Part III. the future of Melilla is discussed, and the opinions of agricultural and mining experts are quoted. It appears that the future of Melilla depends chiefly on the development of the mining industry, the centre of which are the rich iron mines in the Beni-bu-Ifror Mountains. The exploitation of the mines is, unfortunately, complicated first by the want of good roads, railways and shipping wharves, and secondly by international difficulties regarding mining rights in the Riff. Agriculture and afforestation may eventually yield a good return, but progress in them is likely to be slow.

Adventures of the Franc-Tireurs of Champagne (Aventures des Francs-Tireurs de la Champagne). By Captain Lange. 127 pp. Soissons, 1909. Democrate Soissonnais. 1/-.

This account of the Champagne Franc-Tireurs strikes a more tragic note than the preceding book. The author and many of his subordinates were tried after the war by French courts for murder and robbery. Hence the book may not be altogether impartial. In any case it is made clear that the Franc-Tireurs not only gave no quarter to, nor received any from, the German troops, but that they also inflicted the death penalty on Frenchmen whom they caught selling provisions to or helping the invaders.

Reminiscences of a Franc-Tireur during the Siege of Paris (Souvenirs d'un Franc-Tireur pendant le Siège de Paris). By G. Guillaume. 318 pp. Paris. Berger-Levrault. 3/-.

This is the third edition of a book which was originally published in 1871. The author was Swiss, and therefore fairly impartial. The book does not pretend to be a serious contribution to military history, but it gives a graphic and sometimes amusing account of the utter want of discipline in the Franc-Tireurs and Garde Nationale.

A Short History of Burma. By S. W. Cocks. 229 pp., with 1 map, an introduction, index and chronological table of chief events. 8vo. London, 1910. Macmillan. 2/-.

This little book gives the history of Burma in a concise tabulated form, commencing with the prehistoric period and early traditions and closes with the annexation of Upper Burma on the 1st January, 1886. The two final chapters deal with Arakan and its population, and society and government under the Alaungpaya dynasty, of which King Thibaw was the last representative.

Marshal Berthier's Reports to the Emperor during the Campaign of 1813 (Rapports du Maréchal Berthier à l'empereur pendant la campagne de 1813). By X. 2 vols. 510 pp. and 423 pp. 8vo. Paris, 1909. Chapelot. 16/-.

These volumes contain all the reports made to the Emperor by his Chief of Staff during the period 15th March to 31st December, 1813. Some of the documents are merely "covering minutes" transmitting the reports of subordinate officers and are of little interest, while others which exhibit the distribution of troops at different periods are of considerable historical value. The majority deal with purely routine matters placed before the Emperor for his decision, and they provoke amazement that it was possible for him to achieve success in war and govern half Europe when he must have been obliged by his centralised method of staff work to devote many hours and days to office papers. There are reports referring to him for decision appointments on the staffs of subordinate generals, regimental promotions, recommendations for the Legion of Honour and hundreds of minor matters which might well have been settled by a man of Berthier's rank.

The following are specimens of the reports:—

(*a*) "Sire, the Prince de la Moskova requests:—

(1) that Capt. Valicon of the 144th Infantry Regiment should be transferred to the *Sapeurs;*

(2) that Capt. Peradi of the 136th should become *adjudant de place.*

"He requests at the same time authority to send a lieutenant and second lieutenant of the 145th to France for recruiting purposes.

"I have the honour to propose to your Majesty to authorise me to give the necessary orders for the execution of these different matters."

(*b*) "Marshal the Duke of Castiglione presents as likely to become a good second lieutenant, Mr. Ellena, ex-sergeant of the 67th, discharged in 1811 after three years' service on account of wounds.

"Mr. Ellena has recovered from his wounds, and requests to rejoin the army; he is 20 years of age.

"If your Majesty is pleased to grant him the rank of second lieutenant, he can be placed in the 7th Infantry Regiment, XIIth Army Corps."

(*c*) "I have the honour to place before your Majesty a letter of General Bruyère, in which he requests the decoration of the Legion of Honour for Lieutenant Nypels, 7th Hussars. This officer has been previously recommended by General Bruyère."

(*d*) "Sire, your Majesty has not yet given me orders for the Treasury Chest, which is escorted by the 4th Battalion of the 37th Light Infantry, and ought to arrive at Erfurt this evening, there to attend further orders: I request orders for the 37th if the Chest remains at Erfurt."

(*e*) "I have the honour to place before your Majesty a letter that I have received from Count Durosnel, in which he reports the request of General Gersdorf for authority to withdraw four 12 pr. and four 6 pr. guns, forming part of the armament of Dresden and Neustadt; these guns are required by the Saxon Artillery, which is about to take the field."

Some of the reports are merely marked "Approved. Napoleon"; but others contain detailed directions; the last, for instance, is minuted "Approved. Replace them by some siege pieces, which can be taken from Torgau or Koenigstein. Dresden, 29th June. Napoleon."

The French General Staff Account of the Campaign of 1870-71. *Its Truth and Its Errors.* Vol. IX. Part 2. (Das französische Generalstabswerk über den Krieg 1870-71. Wahres und Falsches). By Colonel E. v. Schmid and Colonel P. Kolbe. 306 pp., with 9 maps. 8vo. Leipzig, 1910. Engelmann. 10/-.

This volume deals with the French "Army of Châlons," and covers the period from 31st August to the capitulation of that army on 1st September. As in previous volumes, the narrative is based on the French General Staff account of the operations, and this is critically examined by the authors.

The Camel Corps (Le Régiment des Dromadaires). By Captain de la Grèverie, of the Historical Section of the French General Staff. 122 pp. 8vo. Paris, 1910. Berget-Levrault. 2/5.

The author, in his preface, explains that up to the present time the records of the Camel Corps organised by Bonaparte in Egypt have not been collected, and that, notably in 1843, when the creation of such a corps was advocated in some quarters as a useful adjunct to the army in Algeria, previous experience was not forthcoming upon which to base a new venture on similar lines. This little book is a useful and comprehensive narrative of the *rôle* played by the corps during the French occupation. Events of a general nature are lightly touched upon, and the tactics of the corps explained. There were two kinds of troops mounted on camels, mounted infantry and the Camel Corps; the tactics of both, however, were the same; they both acted as mounted infantry, and the men were infantrymen. In a general engagement a square was formed, and the animals lay down and served as a breastwork over which the men fired.

The French Cavalry under the Directory (La cavalerie sous le Directoire). By Lieutenant-Colonel Desbrière and Captain Sautai. 454 pp., with 8 maps and sketches. 8vo. Paris, 1910. Berger-Levrault. 8/-.

The most salient feature of this interesting study is the explanation of the methods by which the Government of the Directory succeeded in mounting its cavalry at a time when the turmoil of revolution had paralysed the life of the country. The campaigns of the period are outlined, and ample evidence is given of the extreme difficulty found in efficiently carrying out great cavalry movements without an adequate system of remounts. The latter part of the volume is devoted to a study of the strategical and tactical employment of cavalry with the armies operating on the Rhine and in Egypt. There is an interesting account of the change in tactics which the French cavalry had to make when fighting irregulars in Egypt.

Great Cavalry Leaders of the First Empire (Les Grands Cavaliers du Premier Empire), 3rd series. By General Thoumas. 439 pp. 8vo. Paris, 1909. Berger-Levrault. 4/10.

This volume deals with the military history of Grouchy, Vagnair de Marisy, Lefebvre-Desnoëttes, Bessières, Sébastiani, d'Hautpoul, Coulaincourt, Latour-Maubourg and Espagne. The battles in which these generals took prominent parts are tersely described and a great deal of valuable information is given.

General Thoumas deals with many situations upon which history has hitherto hesitated to pronounce a decision; his clear and lucid reasoning, together with the mass of evidence he produces, cannot fail to be of value to the military student.

Quatre-Bras, Ligny, Waterloo and Wavre (Les Quatre-Bras, Ligny, Waterloo et Wavre). By Louis Navez. 2 vols. 610 pp., with 70 plates, 5 diagrams and 2 maps. 8vo. Brussels, 1910. J. Lebègue and Co.

The present work is a revised edition of the original study, published in 1904. It is interesting from the fact that the main features of the campaign are not merged in a mass of detail as is often the case in modern historical studies. The value of the documents quoted is carefully weighed and their origin discussed. The work is easy and pleasant to read, as well as instructive.

Joachim Murat: Letters and Documents. 3rd and 4th vols., 1804-06. Published by Prince Murat, with an introduction and notes by Paul Le Brethon. 1004 pp., with index. 8vo. Paris, 1909. Plon-Nourrit. 11/-.

The third volume deals exclusively with the government of Paris from 1804 to 1805, when Murat was its Governor. The connection of Murat with the execution of the Prince d'Enghien is exhaustively dealt with, and his attitude vindicated; it would seem from the documentary evidence produced that, although officially the proceedings which preceded the execution of the unfortunate Prince passed through his hands, yet he made every effort to save him. There are also numerous letters from Napoleon to Murat and some of a particular interest from generals and officials, bearing on the political and military situation of the time. Most of the letters, however, are from Murat, written either to friends or in answer to petitions and expressions of loyalty from deputations; they are only of minor interest.

The fourth volume deals with the period extending from 1805 and 1806, during which Murat abandoned the Governorship of Paris for the command of the army in course of assembly against Austria, and became Sovereign of the Duchies of Berges and Cleves.

The letters relating to military matters have, in a great many instances, already been published, notably in the work of Messrs. Alombert and Colin, "The 1805 Campaign," and in that of Major Foucard, "The 1806 and 1807 Campaigns." There are some interesting letters from Madame Récamier to Murat which prove the somewhat superficial nature of her antagonism to the Empire. Murat seems generally to have doubted his influence over the Emperor, for, when absent, he made every effort to have friends at court, and he counted among his most powerful supporters Fouché, Minister of Police, and Talleyrand; but undoubtedly his best ally was his wife, who kept him constantly informed of Napoleon's moods so that he could adapt himself to them and act in conformity with them. She strove hard to place on his head the royal crown which was to be fatal to him. The book throws an interesting light on the life and intrigues of Napoleon's Court and Ministries.

The Trial under Fire of the Russian Army in the War of 1904-05 (Die Feuerprobe der Russischen Armee in Kriege 1904-5). By Richard Ullrich, Lieutenant in the Reserve of the German Army. 262 pp., with 29 illustrations and 8 plans. 8vo. Berlin 1910. R. Eisenschmidt. 7/3.

Seldom has a more instructive and fascinating book than this been published about a campaign. The author had to leave the German Army after some seven years' service, on medical grounds, just before the Manchurian war. He had previously mastered the Russian language and established friendly relations

with many Russian officers, including General Orlov. When this officer obtained command of the 3rd Division (XVII. Army Corps), Ullrich received permission to join his headquarters as a guest. He arrived shortly before the battle of Hei-kou-tai, took part in this action, and in the battle of Mukden, and in the retreat on Tieh-ling. During the summer of 1905 he was attached to General Rennenkampf's Corps on the east of the Russian battle front. He also visited Vladivostok.

The author claims to be an impartial though candid critic of the Tzar's forces, but his story, which bears throughout the impress of the expert eye-witness, leaves a most unfavourable impression of the Russian Army. For the military reader the interest of the book is two-fold: It proves the supreme importance of *moral*, and it contains details of tactics, engineering, administration, &c., which are of value as coming from a professional soldier and free-spoken narrator.

Whilst praising the bravery of the officers and men of a heavy battery and of some infantry at Mukden, as well as of Rennenkampf's dismounted Cossacks, he passes severe strictures on the cowardice, drunkenness and luxury of many generals and officers, and declares the high estimate in which the Russian soldier is held to be unjustifiable. General Rennenkampf, however, is repeatedly cited as a brave man and good disciplinarian. Of the Russian soldier the author says that his character is too dependent for present-day fighting, and accordingly he lays emphasis on the special importance of personality amongst leaders in the Russian Army. He draws a vivid picture of indiscipline and panics after Mukden, but praises the conduct of several units, especially the mounted scouts, in this battle, and declares the charge of advancing in unduly dense formations to be groundless as far as the infantry at Mukden were concerned. The staff officers according to him were too theoretical, and many, appointed on account of family influence, were grossly incompetent. The infantry officers he found listless and lethargic, whilst throughout the commissioned ranks bitter personal animosities, self seeking and medal-hunting were rampant. Whilst defending those at the front against the charge of luxurious living, he portrays in lurid colours the rioting and debauchery that went on behind, and the outrageous ill-treatment of the harmless Chinese. From this the author draws a moral: "Be strong," he says, "for, whilst man remains what he is, the weak will be trampled on."

Very interesting are the details about artillery fire; the author was favourably impressed with the fire-control system, but not with the tactics. Shrapnel fire appears to have given poor results on the whole, but the moral and material effect of Japanese 11-inch shells was great.

The medical organisation appears to have been fairly good, though the insanitary camps and filthy habits of officers and men are several times mentioned. Enthusiastic encomiums are passed on the Russian field kitchens. Two instances are given of criminally careless work by reconnoitring officers; their shirking methods and garbled reports had far-reaching results at Mukden. He blames the Japanese for lack of enterprise after Mukden and declares that they could then have captured and destroyed a great part of the Russian Army and imposed their own terms of peace. The Japanese higher leading on the whole, and their infantry tactics come in for warm praise. Descriptions, with rough sketches, are given of Russian trenches and head cover, the respective merits of various types being discussed. Wire entanglements are criticised as disclosing positions, besides being easily destroyed by artillery. The author prefers trip wires, of which he gives a sketch. Many useful hints are given on intelligence duties; and the value of close reconnaissance before attack is illustrated by Japanese and Russian procedure, especially the former.

Of machine guns he says that at short ranges and in pursuit they effect more than artillery, but they are of little use against troops who are sheltered by banks or buildings. Strong emplacements should be made for machine guns, and artillery should not grudge ammunition in its attempt to put these weapons out of action. Machine guns should be controlled by the divisional commander, supervised by a specially-trained officer, and allotted to regiments as required.

Good glasses are a *sine quâ non* for all officers of an army, and the enemy's tactics must be carefully studied so as to draw correct inferences from what is seen.

Digging in the attack, he says, provides some cover, and a rest for the rifle; it also hides from view, and consequently the enemy's reinforcements will not know where to aim.

The general moral of the book is: Character is more important for leaders than attainments, although sound study is a necessary preliminary; in tactics the form matters less than adaptation of means and methods to the needs of the moment. Strict discipline is essential.

The well known military writer, Colonel Balck, contributes an introduction.

Final Reports on the 1848 *Campaign* (Relazioni e rapporti finali sulla campagna del 1848). Vol. II. Published by the Historical Section of the Italian General Staff. 522 pp., with 1 map. 8vo. Rome, 1910. 4/6.

This volume contains reports by some fifty subordinate commanders, ranging from infantry brigadiers to captains commanding "legions" of volunteers. They include a species of staff diary of the units concerned, and suggestions made by their commanders as to the equipment, tactical handling and instruction of the troops. The whole of the campaign in the provinces of Lombardy and Venice is covered, special mention being made of the battles of Goito and Custozza. It will be found a useful and interesting book of reference by students of this campaign.

ORGANISATION AND ADMINISTRATION.

The Feeding and Re-Victualling of Armies in the Field. (Alimentation et ravitaillement des armées en Campagne). By M. Peyrolle. 622 pp., with 30 diagrams and 20 tables. Paris, 1910. Lavauzelle. 8/-.

This volume embodies the lectures delivered by the author at the French Staff College in 1896 97. It is a study, based on history, of the requirements of armies in the field and of the methods by which these requirements can best be met.

The first section of the book is devoted to a detailed description of the duties of commanders and staffs with regard to the supplying of troops in time of war; a short historical sketch of the various systems of subsistence adopted in continental campaigns up to 1870 is also given, and some general conclusions are drawn explaining the system of supplying troops in vogue to-day. The principles of the co-ordination and organization of the lines of communication are laid down, and the organization of magazines, means of transport, the use of railways and canals, and the supplying of an army by its base are also dealt with.

The second section of the work is devoted to details of the administrative organization of the *personnel* and the various resources and means of action at the disposal of the supply establishments at the bases and with the army. This section is perhaps the most important from the staff officer's point of view, for the various kinds of depôts are minutely described, as are also convoys and stations used as supply bases.

The third section is almost as important as the preceding one, for it deals with:—General notes regarding provisions; a sketch of needs and resources, a war reserve, means of obtaining supplies in time of war (cash, requisitions, sale of timber, requisition of crops, supplies taken from the enemy, loans from foreign Powers); destruction of supplies, compensation for requisitions and destruction of property; local resources (statistics of zones of requisitions, war contributions, national gifts, help societies, national revictualling). The remainder of the book deals with the administrative services and with all the forms of supply which may be used to feed an army in the field, and includes also transport by sea, billeting, bedding, etc.

Finally, Section X deals with money transactions affecting supply, and Section XI with fortresses and coast defence troops; Section XII with manœuvres and the training of the staff; Section XIII with the application of the law requisitions at manœuvres; Section XIV with the field administration of armies, in Germany, Austria and Russia; and Section XV with the German invasion of 1870.

The book is a standard work, and will certainly be welcomed in this country; it is lucid and accurate, and is well worthy of a close study by all officers.

(To be continued.)

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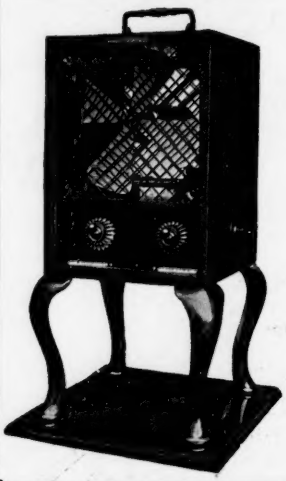

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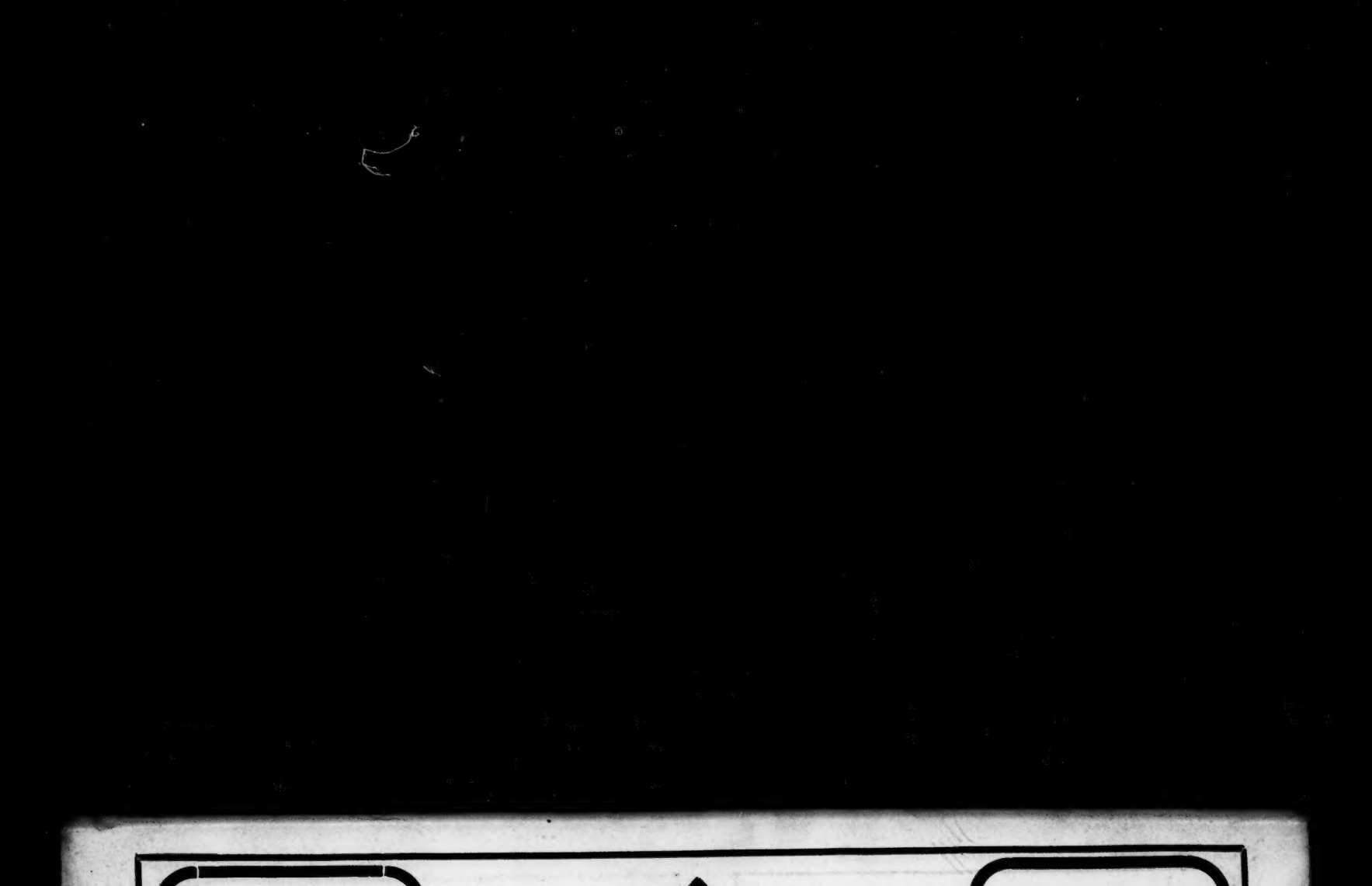
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